United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Virginia Polytechnic Institute and State University

Soil Survey of Lee County, Virginia

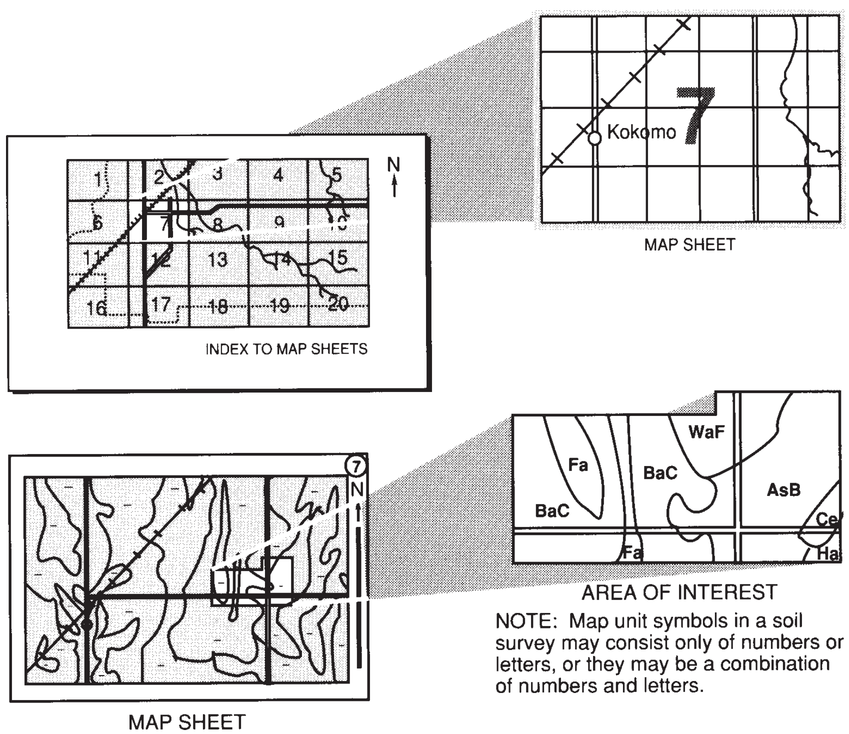
How To Use This Soil Survey

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and go to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Go to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. The most current official data are available at http://soildatamart.nrcs.usda.gov. This survey was made cooperatively by the Natural Resources Conservation Service and the Virginia Polytechnic Institute and State University. The survey is part of the technical assistance furnished to the Daniel Boone Soil and Water Conservation District. The Virginia Department of Conservation and Recreation and the Lee County Board of Supervisors provided financial assistance for the survey.

Cover: An area near Ewing in Lee County. Tumbling, Escatawba, and Jefferson soils are in hayland (in the foreground). Berks and Poplimento soils are in woodland and pastureland (in the middle ground). Wallen soils and areas of rock outcrop are in woodland (in the background). The rock outcrop on Cumberland Mountain is a sandstone member of the Lee Formation.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

Issued 2006

Foreword

This soil survey contains information that affects land use planning in Lee County. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use the survey to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

M. Denise Doetzer
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Lee County, Virginia

By Jeff Thomas, Natural Resources Conservation Service

Fieldwork by Jeff Thomas and Shawn Finn, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Virginia Polytechnic Institute and State University

Lee County is in the southwestern part of Virginia (fig. 1). The county consists of about 425 square miles, or 272,100 acres. The soil survey includes both privately owned land and part of the Cumberland Gap National Historical Park in Virginia. The survey area covers 260,600 acres. It does not include the Jefferson National Forest, part of which covers 11,500 acres in the eastern part of the county.

This soil survey updates the soil survey of Lee County that was published in 1953 *(16)*. It provides additional information and soil maps with a photographic background.

General Nature of the County

This section gives general information about Lee County. It describes history and development; physiography, relief, and drainage; industry; transportation; natural resources; and climate.

History and Development

In 1792, Lee County was formed from 425 square miles of Russell County. It was named in honor of Henry Lee, who was Governor of Virginia from 1791 to 1794. During the Revolutionary War, Lee earned the name "Light-Horse Harry."

In 1750, Dr. Thomas Walker passed through the survey area on his way to the Cumberland Gap. Before his exploration, the local Indians hunted in the area. Cherokees, Shawnees, and members of the Six Nation Federation forbade settlement of any kind. In 1768, an unsuccessful attempt at settlement was made in present-day Rose Hill.

In 1793, Daniel Boone, leading a party to Kentucky, traveled the Wilderness Road through the survey area. In an Indian attack, his eldest son, James, was killed.

In 1774 and 1775, several forts and stations were built in and around Powell Valley. Because of the lack of fortification and military protection, however, many settlers abandoned these places and moved to safety during the Revolutionary War.

Until the end of the Civil War, the economy of Lee County was mainly agricultural. Many water grist mills were built in the county. Coal became important in the late 19th century. The discovery of coal led to the growth of the railroad, which led to the establishment of townships and eventually the present-day municipalities.

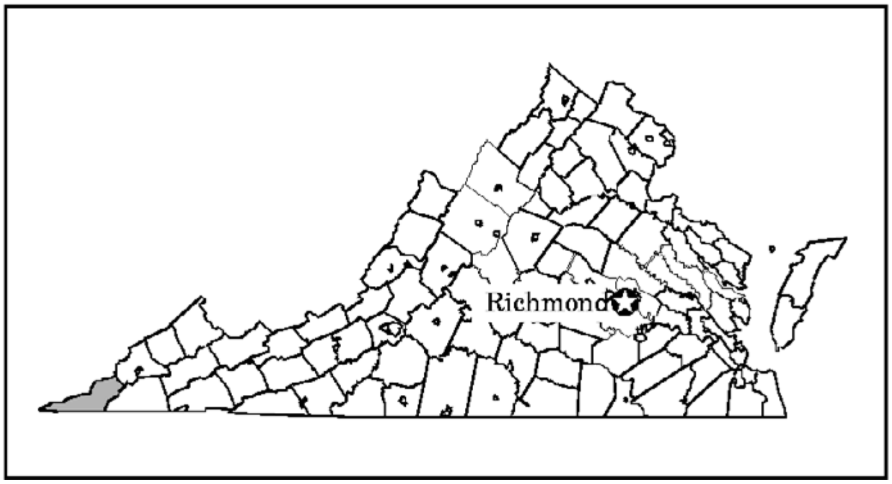


Figure 1.—Location of Lee County in Virginia.

Physiography, Relief, and Drainage

The northern part of Lee County lies in the Appalachian Plateau physiographic province. The rest of Lee County lies in the Valley and Ridge physiographic province *(25).* The Valley and Ridge physiographic province consists of parallel valleys separated by long, narrow, even-topped mountain ridges. Streams have trenched the valley floors. The mountains are folded, and their ridges formed in resistant strata. The valleys formed in the weaker strata. The Appalachian Plateau is a dissected, old plain that consists of broad, smooth ridge summits and very steep, deep, V-shaped mountain side slopes.

The parallel ridges in the county are generally straight and even crested and trend in a northeast-southwest direction. The intervening valleys are narrow to broad and comparatively deep. Differences in the hardness of the underlying bedrock and geologic structure resulted in these valleys and ridges. Powell, Stone, and Cumberland Mountains and Wallen Ridge are underlain by weather-resistant sandstone. In contrast, most of the hills and valleys are underlain by shale and limestone, which are less resistant to weathering than sandstone. The purer limestone breaks down faster than shale and sandstone, and some of the lowest valley floors likely resulted from the deterioration of limestone through solution. The limestone is interstratified with some sandstone in many areas of the limestone belt, but it is mostly interstratified with shale. It contains large quantities of chert—a hard, flinty mineral. Shale, sandstone, and chert, which are resistant to weathering, help to support the ridges in the hills and the limestone valley.

Powell Valley is a broad, limestone valley. It lies between Cumberland and Stone Mountains to the northwest and Wallen Ridge to the southeast. It extends across the county in a southwest-northeast direction from the Virginia-Tennessee State line to the Wise County line. Most of it lies northwest of the Powell River. The widest point in the valley (7 miles) is between the southern boundary, where the Powell River leaves the county in a northwest direction, and the foot of Cumberland Mountain. Further to the northeast the valley tapers and narrows. From Woodway westward it has a smooth surface that is sloping, moderately steep, and steep. Northeastward, its relief is greater but it has some less sloping areas, particularly near to and southwest of Dryden and southeast of Olinger.

Narrow valleys are along the North Fork of the Powell River in the northeastern part of the county, the North Fork of the Clinch River and Wallen Creek in the eastern part,

and Blackwater Creek in the southern part. Wallen Creek Valley generally is comparatively narrow, but it widens to a fairly broad, rounded cove northeast of Stickleyville. Narrow to fairly wide, nearly level bottom lands are along many streams throughout the county.

Cumberland and Stone Mountains rise abruptly northwest of Powell Valley. Wallen Ridge is on the southeast flank of the valley. Many rock escarpments jut out from the face of Cumberland and Stone Mountains, and some of these escarpments continue for great distances. These mountains have very steep slopes and are dissected by numerous drainageways. In the area between Stone and Little Black Mountains, the slopes are very steep and broken and the surface is closely and deeply dissected and level only in narrow areas along streams. Wallen Ridge, Powell Mountain, and Newman Ridge are successive parallel ridges in the eastern and southeastern parts of the county. Their skylines generally are even and their tops are narrow. These ridges are very steep, except near the base, where they are less sloping. They are indented by small drainageways.

Elevation in Lee County ranges from about 1,200 to 3,650 feet above mean sea level, and the general slope dips toward the southwest. The elevation of the limestone valley floor ranges from about 1,200 feet, where the Powell River crosses the Virginia-Tennessee State line, to about 1,800 feet on some of the valley's ridges. The general elevation of the mountains and foothills is about 2,000 to 3,500 feet. Potato Hill is on Little Black Mountain near the northeastern corner of the county. At an elevation of 3,650 feet, Potato Hill is the highest point in the county.

In general, the elevation of Little Black Mountain ranges from about 2,900 to 3,650 feet. Cumberland Mountain extends from the western corner of the county northeastward to a point directly north of Jonesville. At that point it gives way to Stone Mountain, which extends into Wise County, Virginia. The elevations of these mountains range from about 2,500 to 3,000 feet. Poor Valley Ridge runs parallel to the southern feet of Cumberland and Stone Mountains. It has an elevation of about 1,800 to 2,200 feet. In the eastern and southeastern parts of the county, the prominent surface features are Powell Mountain (about 2,000 to 3,500 feet), Wallen Ridge (about 2,000 to 3,200 feet), and Newman Ridge (about 2,000 feet).

The elevations of several towns and villages are as follows: Stickleyville, 1,600 feet; Rose Hill, Jonesville, and Dryden, 1,500 feet; Pennington Gap and Olinger, 1,400 feet; and Blackwater, 1,200 feet.

Surface drainage, which is well established throughout the county, is excessive in many of the steeper areas. Lee County has many streams throughout. The soils are poorly drained on only a few of the low, nearly level flood plains. Most of the soils in the county are well drained. Nearly all the county is drained by the Powell River and its tributaries. A small area in the southeastern part of the county is drained by Blackwater Creek, and a small tract in the eastern part is drained by the North Fork of the Clinch River. These small areas are both in the drainage basin of the Clinch River to the south. In limestone areas some of the surface drainage leads to sinkholes.

The Powell River rises in Wise County and flows southwestward across the middle of Lee County into Tennessee. Its important tributaries are the North Fork of the Powell River and Wallen, Martin, and Indian Creeks. All these streams have cut channels, depending on location, to a depth of 200 to 300 feet below the 1,500-foot level of the valleys on uplands. In some places the channels are less than 200 feet deep, and in other places they are more than 300 feet deep. In drainageways, the slopes are gentle to steep.

Industry

Among Lee County's basic industries, manufacturing has the most important economic benefit. Manufacturing jobs made up almost 22 percent of employment in

Lee County. In 1993, mining in the Lee County area employed 398 persons. In 1990, although agricultural employment in Lee County continued to decline, it still accounted for the primary employment of 602 persons. Supporting employment consisted of local contract construction; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and service industries. It provided an estimated 2,461 jobs in 1993, an increase of 716 jobs from 1980.

Transportation

Highways US-58 and US-58A run east-west through Pennington Gap and Jonesville. At the Tennessee State line, Highway US-58 intersects with I-181 and Highway US-11 to the east, both of which lead to I-81. Highway US-58 Alternate, part of the Virginia Arterial Highway System, connects Jonesville and Pennington Gap with Highway US-23. Highway US-421 connects Pennington Gap to the Kentucky State line. State primary and secondary roads make these main highways accessible to all parts of the county.

Daily motor freight transportation is available from numerous carriers that regularly do business in the region. The two railroad lines that run in Lee County are used for general freight transportation but primarily serve regional coal fields.

Pennington Gap Airport serves Lee County. Commercial air service is available at the Tri-City Airport near Kingsport, Tennessee, about 70 miles from Jonesville, and also at McGee-Tyson Airport in Knoxville, Tennessee.

Natural Resources

Most of Lee County is in the Valley and Ridge physiographic province and is underlain by folded and faulted limestone, dolomite, shale, and sandstone formations. The northeastern edge of the county is in the Appalachian Plateau physiographic province. This part of the county is underlain by nearly horizontal strata of shale, sandstone, and coal.

Wells are nearly everywhere in the county and provide sufficient quantities of water for farm and home needs. Springs provide water for many schools and towns. Springs and cisterns supply water to many farms and rural residences.

Lee County lies in the Tennessee River Basin. The main streams in the county are the Powell River and its tributaries. The Powell River is a headwater stream; thus, the size of the area it drains provides it with only a moderate supply of surface water.

Lee County is underlain entirely by sedimentary rocks. Mining of bituminous coal is an important industry in the part of the county in the Appalachian Plateau. In 1991, 28 coal mines produced a total of 2,025,643 tons of coal.

About 47 percent of Lee County is underlain by limestone that is either mostly dolomitic or magnesium-bearing, impure calcium limestone. Several companies quarry and crush limestone for such uses as road-building material and concrete aggregate.

Timber in Lee County covers about 158,000 acres. The pine type makes up about 6 percent of this acreage, and the oak-hickory type makes up 94 percent. Most timber in the county is harvested for a pulpwood mill in nearby Kingsport, Tennessee. In addition, some sawtimber is produced for use in making furniture, architectural woodwork, and veneer.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Pennington Gap, Virginia, in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 gives data on length of the growing season.

In winter, the average temperature is 36.2 degrees F and the average daily minimum temperature is 24.3 degrees. The lowest temperature on record, which occurred at Pennington Gap on January 21, 1985, is -25 degrees. In summer, the average temperature is 72.1 degrees and the average daily maximum temperature is 84.6 degrees. The highest temperature, which occurred at Pennington Gap on August 21, 1983, is 101 degrees.

Growing degree days are shown table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 50.40 inches. Of this, 21.11 inches, or about 42 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.42 inches, recorded at Pennington Gap on July 25, 1991. Thunderstorms occur on about 43 days each year, and most occur between June and August.

The average seasonal snowfall is 19.7 inches. The greatest snow depth at any one time during the period of record was 15 inches, recorded on March 13, 1993. On an average, 10 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 15 inches, recorded on March 14, 1993.

The average relative humidity in midafternoon is about 57 percent. Humidity is higher at night, and the average at dawn is about 86 percent. The sun shines 63 percent of the time possible in summer and 42 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform (see figures 2, 3, and 4). By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock

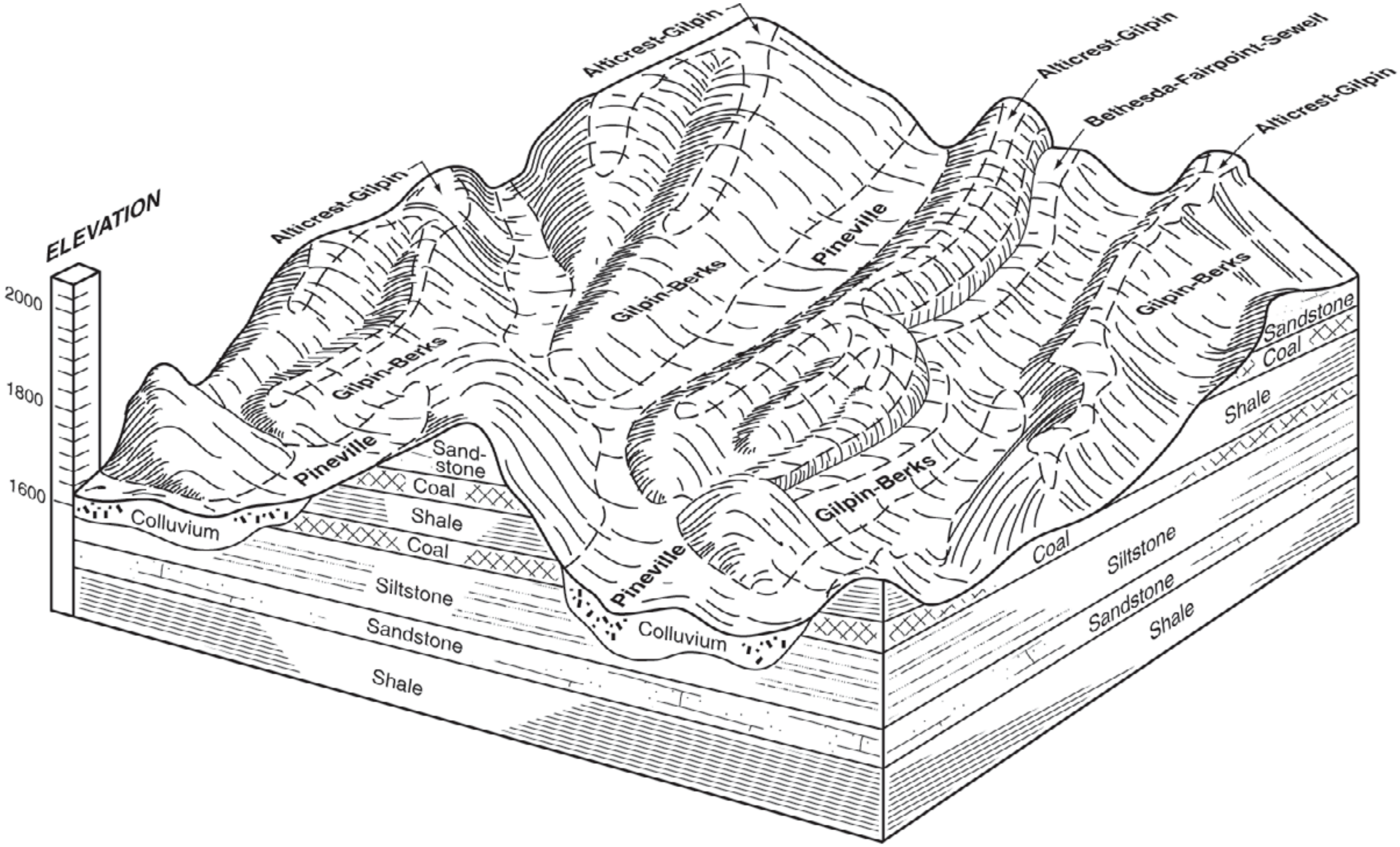


Figure 2.—Typical pattern of soils in the Appalachian Plateau portion of Lee County. The soils named on the land surface are shown in their natural relationship to each other and in their relationship to parent material and landform position.

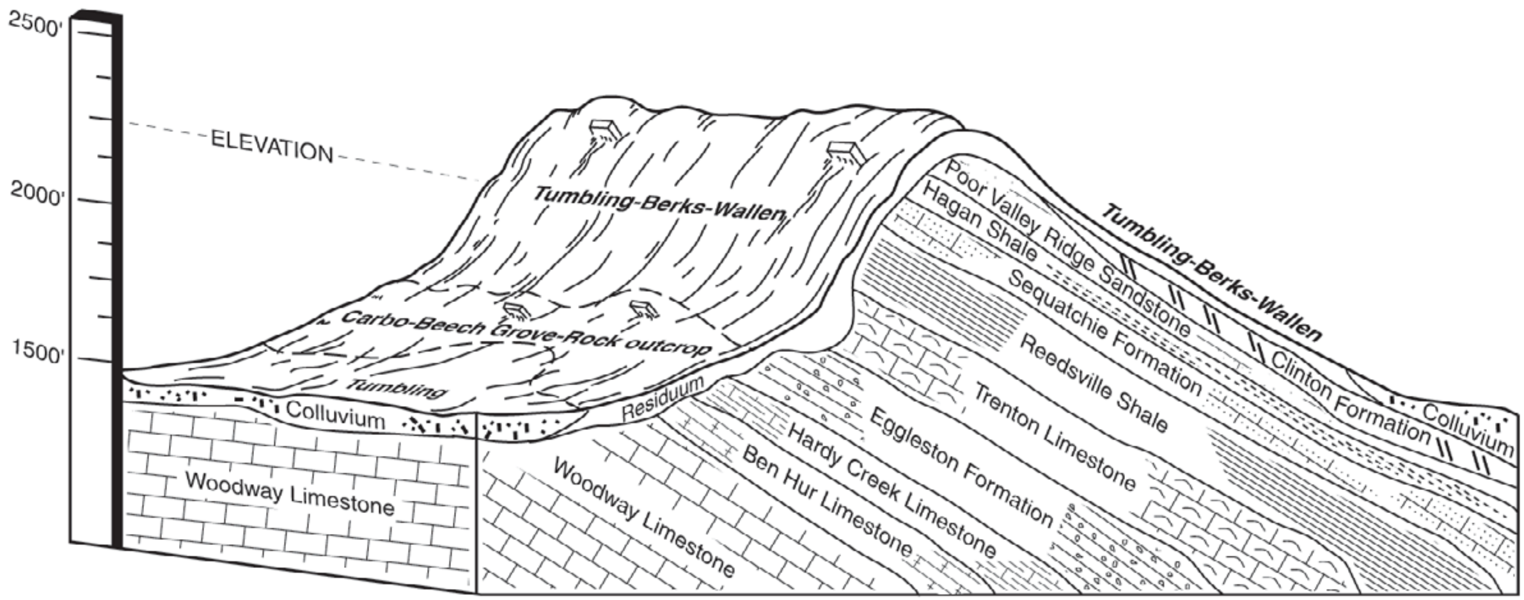


Figure 3.—Typical pattern of soils in areas of Powell Mountain, Wallen Ridge, and Poor Valley Ridge. The soils named on the land surface are shown in their natural relationship to each other and in their relationship to parent material and landform position.

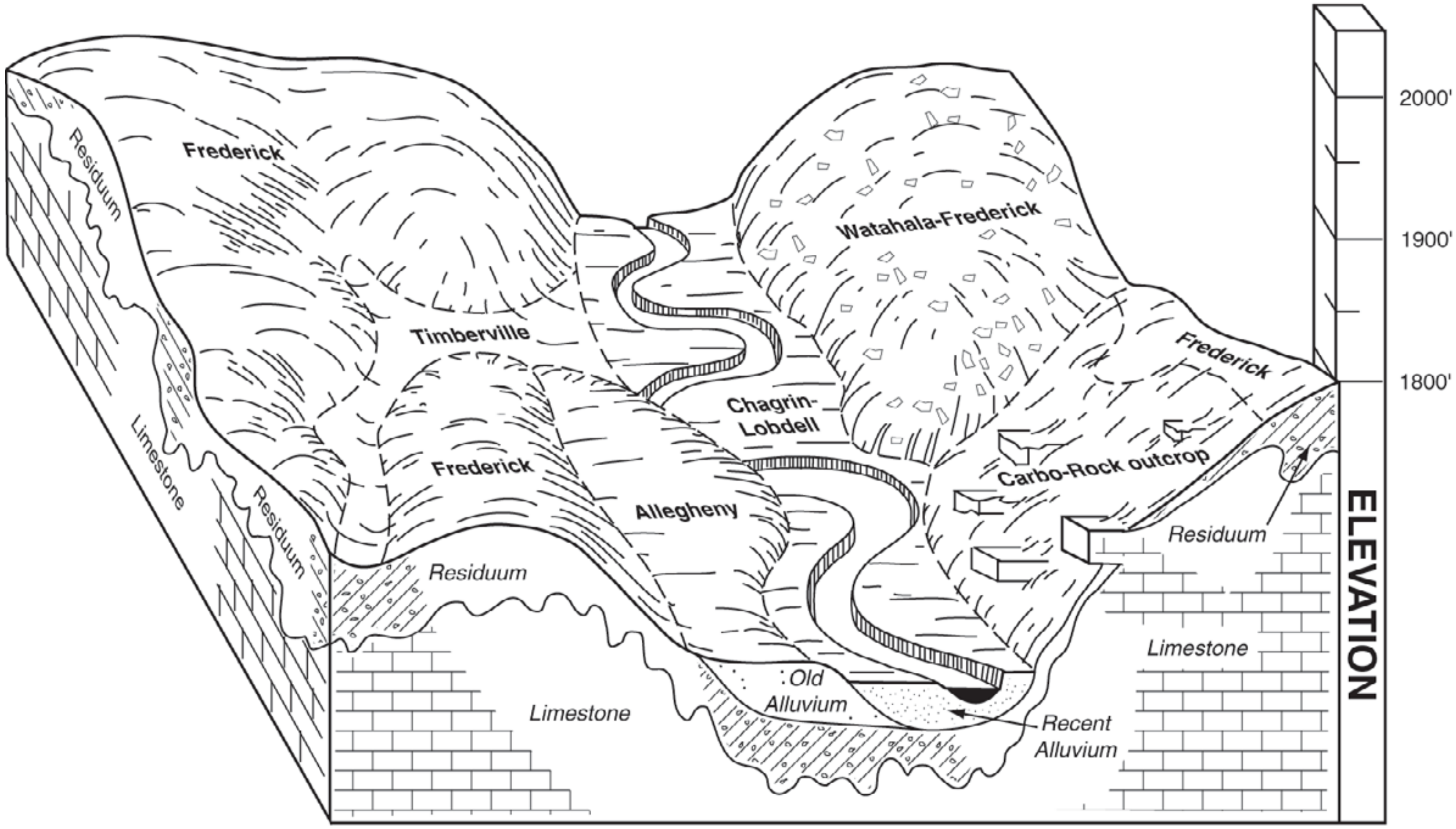


Figure 4.—Typical pattern of soils that are underlain with limestone. The soils named on the land surface are shown in their natural relationship to each other and in their relationship to parent material and landform position.

fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area may not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Detailed Soil Map Units

The map units delineated on the detailed soil maps represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis

of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Jefferson loam, 15 to 35 percent slopes, very stony, is a phase of the Jefferson series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Frederick-Carbo complex, 25 to 35 percent slopes, rocky, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarries, is an example.

Table 4 gives the acreage and proportionate extent of the map units in this survey area. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

1A—Allegheny loam, 0 to 2 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Low stream terraces in river valleys
Position on the landform: Treads
Size of areas: 5 to 30 acres

Map Unit Composition

Allegheny and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 5 inches—brown loam

Subsoil:
5 to 10 inches—dark yellowish brown loam
10 to 16 inches—yellowish brown clay loam
16 to 30 inches—strong brown clay loam
30 to 62 inches—yellowish brown loam

Minor Components

Dissimilar components:
- Pope soils, which have more sand in the subsoil and are more susceptible to flooding than the Allegheny soil; on narrow floodplains
- Shottower soils, which have more clay and are redder than the Allegheny soil; on higher stream terraces

- Carbo soils, which are moderately deep to limestone bedrock; on adjacent hills
- Lobdell soils, which are moderately well drained; on floodplains in the slightly lower positions
- Soils that are not subject to flooding, on slightly higher terraces

Similar components:
- Soils that have less clay throughout than the Allegheny soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: High (about 9.7 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from sandstone, siltstone, and shale

Use and Management Considerations

Cropland

- This soil is well suited to cropland.

Pastureland

- This soil is well suited to pastureland.

Woodland

Suitability: Well suited to yellow-poplar
- The low soil strength interferes with the construction of haul roads and log landings.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.

Septic tank absorption fields

- This soil is well suited to septic tank absorption fields.

Local roads and streets

- The low soil strength may cause structural damage to local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 1
Virginia soil management group: L
Hydric soil: No
Prime farmland: All areas are prime farmland

1B—Allegheny loam, 2 to 7 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Low stream terraces in river valleys
Position on the landform: Treads
Size of areas: 5 to 30 acres

Map Unit Composition

Allegheny and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 5 inches—brown loam

Subsoil:
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Minor Components

Dissimilar components:
- Pope soils, which have more sand in the subsoil and are more susceptible to flooding than the Allegheny soil; on narrow floodplains
- Shottower soils, which have more clay and are redder than the Allegheny soil; on higher stream terraces
- Carbo soils, which are moderately deep to limestone bedrock; on adjacent hills
- Lobdell soils, which are moderately well drained; on floodplains in the slightly lower landform positions
- Soils that are not subject to flooding, on slightly higher terraces

Similar components:
- Soils that have less clay than the Allegheny soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: High (about 9.7 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from sandstone, siltstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay

- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Well suited to yellow-poplar
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.

Septic tank absorption fields

- This soil is well suited to septic tank absorption fields.

Local roads and streets

- The low soil strength may cause structural damage to local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e
Virginia soil management group: L
Hydric soil: No
Prime farmland: All areas are prime farmland

2D—Alticrest-Gilpin complex, 15 to 35 percent slopes

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 75 acres

Map Unit Composition

Note: These Alticrest and Gilpin soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Alticrest and similar soils: Typically 70 percent; ranging from about 60 to 90 percent
Gilpin and similar soils: Typically 25 percent; ranging from about 10 to 35 percent

Typical Profile

Alticrest

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown fine sandy loam

Subsoil:
3 to 5 inches—dark yellowish brown sandy loam
5 to 17 inches—yellowish brown sandy loam
17 to 27 inches—strong brown sandy loam

Substratum:
27 to 30 inches—strong brown loamy sand

Hard bedrock:
30 inches—sandstone bedrock

Gilpin

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Soils that are very deep to sandstone bedrock, in similar landform positions
- Sandstone outcrops, in similar landform positions

Similar components:
- Soils that are shallow to sandstone bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Alticrest—low (about 3.6 inches); Gilpin—low (about 4.4 inches)
Slowest saturated hydraulic conductivity: Alticrest—high (about 2.0 in/hr); Gilpin—moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Alticrest—20 to 40 inches to bedrock (lithic); Gilpin—20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Alticrest—very high; Gilpin—high
Surface fragments: None
Parent material: Alticrest—residuum weathered from sandstone; Gilpin—residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Poorly suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The slope may restrict the use of some farm equipment.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of sand or gravel in the soil increases sloughing and causes cutbanks to be more susceptible to caving.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: Alticrest—FF; Gilpin—U
Hydric soils: No
Prime farmland: Not prime farmland

3E—Beech Grove-Rock outcrop complex, 3 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Beech Grove—broad summits, shoulders, and backslopes; Rock outcrop—scattered areas on summits and shoulders or near-vertical cliffs on backslopes
Size of areas: 5 to 1,000 acres

Map Unit Composition

Note: This Beech Grove soil and areas of Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Beech Grove and similar soils: Typically 55 percent; ranging from about 40 to 70 percent
Rock outcrop: Typically 35 percent; ranging from about 20 to 50 percent

Typical Profile

Beech Grove

Surface layer:
0 to 3 inches—very dark brown silt loam

Hard bedrock:
3 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. Outcrops can be near-vertical cliffs or 0.5- to 5-foot tall outcrops on uplands.

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions
- Areas that have fewer rock outcrops, in similar landform positions

Properties and Qualities of the Beech Grove Soil

Available water capacity: Very low (about 0.6 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very shallow (less than 10 inches)
Depth to root-restrictive feature: 1 to 8 inches to bedrock (lithic)
Drainage class: Excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0 to 1 percent subangular channers and flagstones
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pastureland

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.

- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding are impractical.
- The depth to hard bedrock restricts the use of equipment during site preparation for planting or seeding and interferes with mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, the Beech Grove soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Beech Grove—7s; Rock outcrop—8s
Virginia soil management group: Beech Grove—JJ; Rock outcrop—none assigned
Hydric soils: No
Prime farmland: Not prime farmland

4E—Berks-Poplimento complex, 35 to 55 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 30 to 500 acres

Map Unit Composition

Note: These Berks and Poplimento soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Berks and similar soils: Typically 60 percent; ranging from about 45 to 70 percent
Poplimento and similar soils: Typically 30 percent; ranging from about 20 to 40 percent

Typical Profile

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Poplimento

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 15 inches—dark yellowish brown silty clay loam
15 to 30 inches—yellowish brown clay
30 to 55 inches—yellowish brown clay; brownish yellow mottles and black manganese masses
55 to 62 inches—yellowish brown silty clay; light gray mottles and black manganese masses

Minor Components

Dissimilar components:
- Oriskany soils, which are very deep and have many stones in the soil; on footslopes and adjacent to drainageways
- Soils that are shallow to limestone bedrock and have clayey textures in the subsoil, in similar landform positions
- Areas that have limestone outcrops, in similar landscape positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions in the highest areas in the map unit
- Tumbling soils, which are very deep; on footslopes, on concave-shaped backslopes, and in areas adjacent to drainageways
- Soils that are very deep to bedrock and have loamy subsoils, in similar landform positions in the lowest areas in the map unit

Soil Properties and Qualities

Available water capacity: Berks—very low (about 2.2 inches); Poplimento—moderate (about 8.3 inches)
Slowest saturated hydraulic conductivity: Berks—moderately high (about 0.6 in/hr); Poplimento—moderately high (about 0.20 in/hr)
Depth class: Berks—moderately deep (20 to 40 inches); Poplimento—very deep (more than 60 inches)
Depth to root-restrictive feature: Berks—20 to 40 inches to bedrock (lithic); Poplimento—more than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Berks—low; Poplimento—high
Runoff class: High
Surface fragments: None

Parent material: Berks—residuum weathered from shale and siltstone; Poplimento—residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Berks—JJ; Poplimento—M
Hydric soils: No
Prime farmland: Not prime farmland

4F—Berks-Poplimento complex, 55 to 65 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 30 to 100 acres

Map Unit Composition

Note: These Berks and Poplimento soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Berks and similar soils: Typically 60 percent; ranging from about 45 to 70 percent
Poplimento and similar soils: Typically 30 percent; ranging from about 20 to 40 percent

Typical Profile

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Poplimento

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 15 inches—dark yellowish brown silty clay loam
15 to 30 inches—yellowish brown clay
30 to 55 inches—yellowish brown clay; brownish yellow mottles and black manganese masses
55 to 62 inches—yellowish brown silty clay; light gray mottles and black manganese masses

Minor Components

Dissimilar components:
- Oriskany soils, which are very deep and have many stones in the soil; on footslopes and adjacent to drainageways
- Soils that are shallow to limestone bedrock and have clayey textures in the subsoil, in similar landform positions
- Areas that have limestone outcrops, in similar landscape positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions in the highest areas in the map unit

- Tumbling soils, which are very deep; on footslopes, on concave-shaped backslopes, and in areas adjacent to drainageways
- Soils that are very deep to bedrock and have loamy subsoils, in similar landform positions in the lowest areas in the map unit

Soil Properties and Qualities

Available water capacity: Berks—very low (about 2.2 inches); Poplimento—moderate (about 8.3 inches)
Slowest saturated hydraulic conductivity: Berks—moderately high (about 0.6 in/hr); Poplimento—moderately high (about 0.20 in/hr)
Depth class: Berks—moderately deep (20 to 40 inches); Poplimento—very deep (more than 60 inches)
Depth to root-restrictive feature: Berks—20 to 40 inches to bedrock (lithic); Poplimento—more than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Berks—low; Poplimento—high
Runoff class: High
Surface fragments: None
Parent material: Berks—residuum weathered from shale and siltstone; Poplimento—residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, these are soils unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Berks—JJ; Poplimento—M
Hydric soils: No
Prime farmland: Not prime farmland

5D—Berks-Weikert complex, 15 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 10 to 100 acres

Map Unit Composition

Note: These Berks and Weikert soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Berks and similar soils: Typically 55 percent; ranging from about 45 to 65 percent
Weikert and similar soils: Typically 35 percent; ranging from about 25 to 45 percent

Typical Profile

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Weikert

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—dark brown silt loam

Subsoil:
3 to 11 inches—dark yellowish brown very channery silt loam
11 to 15 inches—yellowish brown very channery silt loam

Hard bedrock:
15 inches—shale bedrock

Minor Components

Dissimilar components:
- Soils that are deep to shale bedrock and have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions
- Soils that are very deep to bedrock and have fewer rock fragments and more clay in the subsoil than the Berks and Weikert soils, on footslopes and concave head slopes

Similar components:
- Gilpin soils, which have fewer rock fragments in the subsoil than the Berks and Weikert soils; in similar landform positions
- Soils that are shallow to shale bedrock and have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Berks—very low (about 2.2 inches); Weikert—very low (about 1.5 inches)
Slowest saturated hydraulic conductivity: Berks—moderately high (about 0.6 in/hr); Weikert—high (about 2.0 in/hr)
Depth class: Berks—moderately deep (20 to 40 inches); Weikert—shallow (10 to 20 inches)
Depth to root-restrictive feature: Berks—20 to 40 inches to bedrock (lithic); Weikert—10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Poorly suited to pasture
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

- The slope may restrict the use of some farm equipment.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: JJ
Hydric soils: No
Prime farmland: Not prime farmland

5E—Berks-Weikert complex, 35 to 55 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 10 to 300 acres

Map Unit Composition

Note: These Berks and Weikert soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Berks and similar soils: Typically 55 percent; ranging from about 45 to 65 percent
Weikert and similar soils: Typically 35 percent; ranging from about 25 to 45 percent

Typical Profile

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Weikert

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer
1 to 3 inches—dark brown silt loam

Subsoil:
3 to 11 inches—dark yellowish brown very channery silt loam
11 to 15 inches—yellowish brown very channery silt loam

Hard bedrock:
15 inches—shale bedrock

Minor Components

Dissimilar components:
- Poplimento soils, which are very deep to bedrock and have fewer rock fragments and more clay in the subsoil than the Berks and Weikert soils; in similar landform positions
- Tumbling soils, which are very deep and have more clay and fewer rock fragments than the Berks and Weikert soils; on footslopes, on concave-shaped backslopes, and in areas adjacent to drainageways
- Oriskany soils, which are very deep and have many stones in the soil; on footslopes and adjacent to drainageways
- Soils that are deep to shale bedrock and that have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions

Similar components:
- Gilpin soils, which have fewer rock fragments in the subsoil than the Berks and Weikert soils; in similar landform positions
- Soils that are shallow to shale bedrock and have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Berks—very low (about 2.2 inches); Weikert—very low (about 1.5 inches)

Slowest saturated hydraulic conductivity: Berks—moderately high (about 0.6 in/hr); Weikert—high (about 2.0 in/hr)
Depth class: Berks—moderately deep (20 to 40 inches); Weikert—shallow (10 to 20 inches)
Depth to root-restrictive feature: Berks—20 to 40 inches to bedrock (lithic); Weikert—10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: JJ
Hydric soils: No
Prime farmland: Not prime farmland

5F—Berks-Weikert complex, 55 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 10 to 300 acres

Map Unit Composition

Note: These Berks and Weikert soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Berks and similar soils: Typically 55 percent; ranging from about 45 to 65 percent
Weikert and similar soils: Typically 35 percent; ranging from about 25 to 45 percent

Typical Profile

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Weikert

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—dark brown silt loam

Subsoil:
3 to 11 inches—dark yellowish brown very channery silt loam
11 to 15 inches—yellowish brown very channery silt loam

Hard bedrock:
15 inches—shale bedrock

Minor Components

Dissimilar components:
- Poplimento soils, which are very deep to bedrock and have fewer rock fragments

and more clay in the subsoil than the Berks and Weikert soils; in similar landform positions
- Tumbling soils, which are very deep and have more clay and fewer rock fragments than the Berks and Weikert soils; on footslopes, on concave-shaped backslopes, and in areas adjacent to drainageways
- Oriskany soils, which are very deep and have many stones in the soil; on footslopes and adjacent to drainageways
- Soils that are deep to shale bedrock and have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions
- Soils that are shallow to limestone bedrock, have more clay in the subsoil than the Berks and Weikert soils, and, in some areas, have limestone rock outcrops; on the north-facing slopes of Wallen Ridge and Powell Mountain

Similar components:
- Gilpin soils, which have fewer rock fragments in the subsoil than the Berks and Weikert soils; in similar landform positions
- Soils that are shallow to shale bedrock and have fewer rock fragments in the subsoil than the Berks and Weikert soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Berks—very low (about 2.2 inches); Weikert—very low (about 1.5 inches)
Slowest saturated hydraulic conductivity: Berks—moderately high (about 0.6 in/hr); Weikert—high (about 2.0 in/hr)
Depth class: Berks—moderately deep (20 to 40 inches); Weikert—shallow (10 to 20 inches)
Depth to root-restrictive feature: Berks—20 to 40 inches to bedrock (lithic); Weikert—10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.

- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: JJ
Hydric soils: No
Prime farmland: Not prime farmland

6E—Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Mountains and hills that have been surface mined for coal
Position on the landform: Dominantly surface-mined benches, outslopes, and highwalls; reclaimed areas are on summits and backslopes
Slope: Generally ranging from 0 to 5 percent on the benches and from 55 to 80 percent on outslopes and nearly vertical as cliffs of highwalls; reclaimed areas have their approximate original contour (0 to 15 percent slopes on summits and 35 to 55 percent slopes on backslopes)
Size of areas: 50 to 500 acres
Note: Many areas have exposed highwalls

Map Unit Composition

Note: This map unit consists of three soils which are not consistently associated geographically and, therefore, do not always occur together in the same map unit delineation. Individual areas of this unit contain varying percentages of Bethesda, Fairpoint, or Sewell soils. These soils were mapped together because there are few major differences in their use and management.

Bethesda and similar soils: Typically 60 percent; ranging from about 35 to 85 percent
Fairpoint and similar soils: Typically 20 percent; ranging from about 10 to 60 percent
Sewell and similar soils: Typically 15 percent; ranging from about 0 to 50 percent

Typical Profile

Bethesda

Surface layer:
0 to 7 inches—dark grayish brown gravelly silt loam

Substratum:
7 to 23 inches—brown and yellowish brown very channery silt loam
23 to 62 inches—very dark grayish brown and dark gray extremely channery silty clay loam

Fairpoint

Surface layer:
0 to 5 inches—very dark grayish brown channery silt loam

Substratum:
5 to 9 inches—yellowish brown very channery loam
9 to 21 inches—very dark gray very channery silt loam; pale olive mottles
21 to 62 inches—brown very channery silt loam; yellowish brown mottles

Sewell

Surface layer:
0 to 10 inches—yellowish brown stony sandy loam; brownish yellow mottles

Substratum:
10 to 62 inches—yellowish brown very stony sandy loam; brownish yellow mottles

Minor Components

Dissimilar components:
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent undisturbed hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent undisturbed hillslopes
- Itmann soils, which contain waste material from deep-mined coal; generally in hollow fills and in waste dumps of coal
- Areas of depressions that pond water, on strip-mined benches at the base of highwalls

Similar components:
- Pineville soils, which formed in very deep colluvium; in undisturbed drainageways and on footslopes

Soil Properties and Qualities

Available water capacity: Bethesda—low (about 3.2 inches); Fairpoint—moderate (about 7.3 inches); Sewell—moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Bethesda and Fairpoint—moderately high (about 0.20 in/hr); Sewell—high (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Bethesda and Fairpoint—well drained; Sewell—somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Bethesda and Sewell—low; Fairpoint—moderate
Runoff class: Bethesda and Fairpoint—high; Sewell—medium

Surface fragments: Bethesda and Fairpoint—none; Sewell—about 0.5 to 3.0 percent stones
Parent material: Bethesda—acid mine spoil or earthy fill derived from shale and siltstone; Fairpoint—nonacid mine spoil or earthy fill derived from shale and siltstone; Sewell—acid mine spoil or earthy fill derived from sandstone
Distinctive soil property: These soils are subject to differential settling

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Poorly suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The use of mechanical planting equipment is impractical because of the content of rock fragments.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of differential settling, these soils are not recommended for building site development.

Septic tank absorption fields

- Because of differential settling, these soils are not recommended for septic tank absorption fields.

Local roads and streets

- Differential settling of the soil may damage local roads and streets.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: JJ
Hydric soils: No
Prime farmland: Not prime farmland

7C—Carbo silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 30 acres

Map Unit Composition

Carbo and similar soils: Typically 80 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Frederick, Watahala, and Poplimento soils, which are very deep to bedrock; in similar landform positions
- Limestone rock outcrops, in similar landform positions

Similar components:
- Soils that are shallow to limestone bedrock, in similar landform positions
- Soils that have less clay in the subsoil than the Carbo soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn and grass-legume hay; not suited to tobacco and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.

- The bedrock and high clay content restrict the rooting depth of crops.
- The limited available water capacity may cause plants to suffer from moisture stress.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitablity: Moderately suited to northern red oak
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: Y
Hydric soil: No
Prime farmland: Not prime farmland

7D—Carbo silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Carbo and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Frederick, Watahala, and Poplimento soils, which are very deep to bedrock; in similar landform positions
- Limestone rock outcrops, in similar landform positions

Similar components:
- Soils that are shallow to limestone bedrock, in similar landform positions
- Soils that have less clay in the subsoil than the Carbo soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn; not suited to tobacco and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.

- The bedrock and high clay content restrict the rooting depth of crops.
- The limited available water capacity may cause plants to suffer from moisture stress.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Moderately suited

- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to northern red oak

- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The stickiness of the soil increases the difficulty of constructing haul roads and log landings when the soil is wet.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e

Virginia soil management group: Y
Hydric soil: No
Prime farmland: Not prime farmland

8C—Carbo-Beech Grove complex, 7 to 15 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 10 to 50 acres

Map Unit Composition

Note: These Carbo and Beech Grove soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Carbo and similar soils: Typically 75 percent; ranging from about 65 to 85 percent
Beech Grove and similar soils: Typically 20 percent; ranging from about 10 to 30 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Beech Grove

Surface layer:
0 to 3 inches—very dark brown silt loam

Hard bedrock:
3 inches—limestone bedrock

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have more rock outcrops than the Carbo and Beech Grove soils, in similar landform positions

Similar components:
- Soils that are shallow to limestone bedrock, in similar landform positions
- Soils that are moderately deep to limestone bedrock and have less clay in the subsoil than the Carbo and Beech Grove soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Carbo—low (about 3.8 inches); Beech Grove—very low (about 0.6 inches)
Slowest saturated hydraulic conductivity: Carbo—moderately low (about 0.06 in/hr); Beech Grove—moderately high (about 0.6 in/hr)
Depth class: Carbo—moderately deep (20 to 40 inches); Beech Grove—very shallow (less than 10 inches)
Depth to root-restrictive feature: Carbo—20 to 40 inches to bedrock (lithic); Beech Grove—1 to 8 inches to bedrock (lithic)
Drainage class: Carbo—well drained; Beech Grove—excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Carbo—high; Beech Grove—low
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn; not suited to tobacco and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- Rock outcrops may limit machinery operations.
- The bedrock and high clay content restrict the rooting depth of crops.
- The limited available water capacity may cause plants to suffer from moisture stress.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak
- The stickiness of the soil increases the difficulty of constructing haul roads and log landings when the soil is wet.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.

- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Carbo—3e; Beech Grove—6s
Virginia soil management group: Carbo—Y; Beech Grove—JJ
Hydric soils: No
Prime farmland: Not prime farmland

8D—Carbo-Beech Grove complex, 15 to 25 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 10 to 50 acres

Map Unit Composition

Note: These Carbo and Beech Grove soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Carbo and similar soils: Typically 75 percent; ranging from about 65 to 85 percent
Beech Grove and similar soils: Typically 20 percent; ranging from about 10 to 30 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam

8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Beech Grove

Surface layer:
0 to 3 inches—very dark brown silt loam

Hard bedrock:
3 inches—limestone bedrock

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have more rock outcrops than the Carbo and Beech Grove soils, in similar landform positions

Similar components:
- Soils that are shallow to limestone bedrock, in similar landform positions
- Soils that are moderately deep to limestone bedrock and have less clay in the subsoil than the Carbo and Beech Grove soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Carbo—low (about 3.8 inches); Beech Grove—very low (about 0.6 inches)
Slowest saturated hydraulic conductivity: Carbo—moderately low (about 0.06 in/hr); Beech Grove—moderately high (about 0.6 in/hr)
Depth class: Carbo—moderately deep (20 to 40 inches); Beech Grove—very shallow (less than 10 inches)
Depth to root-restrictive feature: Carbo—20 to 40 inches to bedrock (lithic); Beech Grove—1 to 8 inches to bedrock (lithic)
Drainage class: Carbo—well drained; Beech Grove—excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Carbo—high; Beech Grove—low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn; not suited to tobacco and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- Rock outcrops may limit machinery operations.
- The bedrock and high clay content restrict the rooting depth of crops.
- The limited available water capacity may cause plants to suffer from moisture stress.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The stickiness of the soil increases the difficulty of constructing haul roads and log landings when the soil is wet.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Carbo—4e; Beech Grove—6s
Virginia soil management group: Carbo—Y; Beech Grove—JJ
Hydric soils: No
Prime farmland: Not prime farmland

8E—Carbo-Beech Grove complex, 25 to 60 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 10 to 75 acres

Map Unit Composition

Note: These Carbo and Beech Grove soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Carbo and similar soils: Typically 60 percent; ranging from about 50 to 70 percent
Beech Grove and similar soils: Typically 30 percent; ranging from about 20 to 40 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Beech Grove

Surface layer:
0 to 3 inches—very dark brown silt loam

Hard bedrock:
3 inches—limestone bedrock

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have more rock outcrops than the Carbo and Beech Grove soils, in similar landform positions

Similar components:
- Soils that are shallow to limestone bedrock, in similar landform positions
- Soils that are moderately deep to limestone bedrock and have less clay in the subsoil than the Carbo and Beech Grove soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Carbo—low (about 3.8 inches); Beech Grove—very low (about 0.6 inches)
Slowest saturated hydraulic conductivity: Carbo—moderately low (about 0.06 in/hr); Beech Grove—moderately high (about 0.6 in/hr)

Depth class: Carbo—moderately deep (20 to 40 inches); Beech Grove—very shallow (less than 10 inches)
Depth to root-restrictive feature: Carbo—20 to 40 inches to bedrock (lithic); Beech Grove—1 to 8 inches to bedrock (lithic)
Drainage class: Carbo—well drained; Beech Grove—excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Carbo—high; Beech Grove—low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The stickiness of the soil increases the difficulty of constructing haul roads and log landings when the soil is wet.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Carbo—Y; Beech Grove—JJ
Hydric soils: No
Prime farmland: Not prime farmland

9C—Carbo-Rock outcrop complex, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 50 acres

Map Unit Composition

Note: This Carbo soil and areas of Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Carbo and similar soils: Typically 80 percent; ranging from about 70 to 90 percent
Rock outcrop: Typically 15 percent; ranging from about 5 to 20 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. Outcrops are a few inches to about 5 feet high.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have fewer rock outcrops, in similar landform positions

Similar components:
- Beech Grove soils, which are very shallow to limestone bedrock; near rock outcrops on summits
- Soils that are shallow to limestone bedrock, in similar landform positions

Properties and Qualities of the Carbo Soil

Available water capacity: Low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pastureland

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, the Carbo soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of the Carbo soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Figure 5.—Outcrops of limestone bedrock in an area of Carbo-Rock outcrop complex, 15 to 25 percent slopes (in the foreground). Many sinkholes are in the area of Frederick silt loam, karst, 7 to 15 percent slopes, in the background. This site is southwest of Dot, Virginia.

Interpretive Groups

Land capability class: Carbo—7s; Rock outcrop—8s
Virginia soil management group: Carbo—Y; Rock outcrop—none assigned
Hydric soils: No
Prime farmland: Not prime farmland

9D—Carbo-Rock outcrop complex, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands (fig. 5)
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: This Carbo soil and areas of Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Carbo and similar soils: Typically 80 percent; ranging from about 70 to 90 percent
Rock outcrop: Typically 15 percent; ranging from about 5 to 20 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. Outcrops are a few inches to about 5 feet high.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have fewer rock outcrops, in similar landform positions

Similar components:
- Beech Grove soils, which are very shallow to limestone bedrock; near rock outcrops on summits
- Soils that are shallow to limestone bedrock, in similar landform positions

Properties and Qualities of the Carbo Soil

Available water capacity: Low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pastureland

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, this Carbo soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of the Carbo soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Carbo—7s; Rock outcrop—8s
Virginia soil management group: Carbo—Y; Rock outcrop—none assigned
Hydric soils: No
Prime farmland: Not prime farmland

9E—Carbo-Rock outcrop complex, 25 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: This Carbo soil and areas of Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Carbo and similar soils: Typically 80 percent; ranging from about 70 to 90 percent
Rock outcrop: Typically 15 percent; ranging from about 5 to 20 percent

Typical Profile

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. Outcrops are a few inches to about 5 feet high.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep to bedrock; in similar landform positions
- Areas that have fewer rock outcrops, in similar landform positions

Similar components:
- Beech Grove soils, which are very shallow to limestone bedrock; near rock outcrops on summits
- Soils that are shallow to limestone bedrock, in similar landform positions

Properties and Qualities of the Carbo Soil

Available water capacity: Low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pastureland

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The stickiness of the soil increases the difficulty of constructing haul roads and log landings when the soil is wet.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, this Carbo soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of the Carbo soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Carbo—7s; Rock outcrop—8s
Virginia soil management group: Carbo—Y; Rock outcrop—none assigned
Hydric soils: No
Prime farmland: Not prime farmland

10A—Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Floodplains along small creeks in valleys (fig. 6)
Position on the landform: Floodplain steps
Size of areas: 5 to 25 acres

Map Unit Composition

Note: These Chagrin and Lobdell soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Chagrin and similar soils: Typically 70 percent; ranging from about 60 to 80 percent
Lobdell and similar soils: Typically 25 percent; ranging from about 15 to 35 percent

Typical Profile

Chagrin

Surface layer:
0 to 6 inches—brown loam

Figure 6.—An area of Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded, on a nearly level floodplain (in the foreground). The pasture (in the middle ground) is in areas of Carbo-Beech Grove complex, 25 to 60 percent slopes, rocky, and Poplimento-Berks complex, 35 to 55 percent slopes. The woodland (in the background) is in areas of Berks-Weikert complex, 55 to 80 percent slopes, and Wallen-Alticrest complex, 15 to 35 percent slopes, very stony.

Subsoil:
6 to 18 inches—dark yellowish brown loam
18 to 42 inches—strong brown sandy clay loam

Substratum:
42 to 62 inches—brown sandy loam

Lobdell

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 20 inches—yellowish brown silt loam; pale brown iron depletions and yellowish brown masses of oxidized iron
20 to 35 inches—yellowish brown loam; light gray iron depletions and yellowish brown masses of oxidized iron
35 to 48 inches—brown loam; yellowish brown masses of oxidized iron and light gray iron depletions

Substratum:
48 to 62 inches—light brownish gray and yellowish brown loam; very dark brown manganese masses

Minor Components

Dissimilar components:
- Holly soils, which are poorly drained; in the slightly lower landform positions
- Allegheny soils, which are well drained and are less subject to flooding than the Chagrin and Lobdell soils; on low stream terraces in the higher areas

- Timberville soils, which are well drained and have more clay in the subsoil than the Chagrin and Lobdell soils; on colluvial footslopes and in colluvial drainageways

Similar components:
- Orrville soils, which are somewhat poorly drained; in similar landform positions
- Pope soils, which are well drained and have less clay in the subsoil than the Chagrin and Lobdell soils; in similar landform positions but closer to creek banks

Soil Properties and Qualities

Available water capacity: Chagrin—high (about 9.1 inches); Lobdell—high (about 10.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Chagrin—well drained; Lobdell—moderately well drained
Depth to seasonal water saturation: Chagrin—about 48 to 72 inches; Lobdell—about 24 to 42 inches
Water table kind: Apparent
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, grass-legume hay, and alfalfa hay; moderately suited to tobacco
- Flooding may damage crops.

Pastureland

Suitability: Well suited
- Flooding may damage pastures.

Woodland

Suitability: Well suited to yellow-poplar
- Flooding may damage haul roads.
- The low soil strength interferes with the construction of haul roads and log landings.
- Flooding restricts the safe use of roads by log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of the flooding, these soils are unsuited to building site development.

Septic tank absorption fields

- Because of the flooding, these soils are unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Chagrin—1; Lobdell—2w

Virginia soil management group: Chagrin—A; Lobdell—G
Hydric soils: No
Prime farmland: All areas are prime farmland

11B—Escatawba-Jefferson complex, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 5 to 40 acres

Map Unit Composition

Note: These Escatawba and Jefferson soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Escatawba and similar soils: Typically 70 percent; ranging from about 50 to 75 percent
Jefferson and similar soils: Typically 25 percent; ranging from about 15 to 40 percent

Typical Profile

Escatawba

Surface layer:
0 to 5 inches—dark brown loam

Subsoil:
5 to 38 inches—yellowish brown loam
38 to 47 inches—strong brown clay loam; pale brown iron depletions
47 to 62 inches—strong brown gravelly clay loam; light brownish gray iron depletions and yellowish red masses of oxidized iron

Jefferson

Surface layer:
0 to 4 inches—brown loam

Subsoil:
4 to 11 inches—dark yellowish brown loam
11 to 23 inches—strong brown clay loam
23 to 42 inches—yellowish brown clay loam
42 to 62 inches—yellowish brown gravelly clay loam; light yellowish brown iron depletions

Minor Components

Dissimilar components:
- Chagrin soils, which are susceptible to flooding; on floodplains near the edge of toeslopes

Similar components:
- Soils that have less sand than the Escatawba and Jefferson soils, in similar landform positions
- Soils that have a seasonal water table at a depth of less than 30 inches, on head slopes, in drainageways, and in saddles of drainage divides

Soil Properties and Qualities

Available water capacity: Escatawba—moderate (about 8.9 inches); Jefferson—moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: Escatawba—moderately high (about 0.20 in/hr); Jefferson—high (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: Escatawba—about 30 to 48 inches; Jefferson—more than 6 feet
Water table kind: Escatawba—perched; Jefferson—not applicable
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Escatawba—medium; Jefferson—low
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, grass-legume hay, and alfalfa hay; poorly suited to tobacco
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic systems.
- The restricted permeability limits the absorption and proper treatment of the effluent from conventional septic systems.

Local roads and streets

- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e

Virginia soil management group: L
Hydric soils: No
Prime farmland: All areas are prime farmland

11C—Escatawba-Jefferson complex, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 5 to 60 acres

Map Unit Composition

Note: These Escatawba and Jefferson soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Escatawba and similar soils: Typically 60 percent; ranging from about 40 to 65 percent
Jefferson and similar soils: Typically 35 percent; ranging from about 25 to 50 percent

Typical Profile

Escatawba

Surface layer:
0 to 5 inches—dark brown loam

Subsoil:
5 to 38 inches—yellowish brown loam
38 to 47 inches—strong brown clay loam; pale brown iron depletions
47 to 62 inches—strong brown gravelly clay loam; light brownish gray iron depletions and yellowish red masses of oxidized iron

Jefferson

Surface layer:
0 to 4 inches—brown loam

Subsoil:
4 to 11 inches—dark yellowish brown loam
11 to 23 inches—strong brown clay loam
23 to 42 inches—yellowish brown clay loam
42 to 62 inches—yellowish brown gravelly clay loam; light yellowish brown iron depletions

Minor Components

Dissimilar components:
- Oriskany soils, which have more rock fragments in the subsoil and on the surface than the Escatawba and Jefferson soils; in the higher landform positions
- Gilpin soils, which are moderately deep to shale bedrock; on shoulders

Similar components:
- Tumbling soils, which have more clay in the subsoil than the Escatawba and Jefferson soils; in similar landform positions
- Soils that have less sand than the Escatawba and Jefferson soils, in similar landform positions

- Soils that have a seasonal high water table at a depth of less than 30 inches, on head slopes and in drainageways
- Areas that have a stony surface, in similar landform positions

Soil Properties and Qualities

Available water capacity: Escatawba—moderate (about 8.9 inches); Jefferson—moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: Escatawba—moderately high (about 0.20 in/hr); Jefferson—high (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: Escatawba—about 30 to 48 inches; Jefferson—more than 6 feet
Water table kind: Escatawba—perched; Jefferson—not applicable
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Escatawba—medium; Jefferson—low
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to grass-legume hay; moderately suited to corn and alfalfa hay; poorly suited to tobacco
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made.
- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic systems.
- The restricted permeability limits the absorption and proper treatment of the effluent from conventional septic systems.
- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: L
Hydric soils: No
Prime farmland: Not prime farmland

12B—Frederick gravelly loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits
Size of areas: 5 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches

Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- This soil is well suited to haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- This soil is well suited to septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e
Virginia soil management group: M
Hydric soil: No
Prime farmland: All areas are prime farmland

12C—Frederick gravelly loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands

Position on the landform: Summits and shoulders
Size of areas: 5 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco; moderately suited to corn, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- This soil is well suited to haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

12D—Frederick gravelly loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.

- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

12E—Frederick gravelly loam, 25 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The slope may also restrict the use of some farm equipment.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

12F—Frederick gravelly loam, 35 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)

Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

13B—Frederick silt loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits
Size of areas: 5 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- This soil is well suited to septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e
Virginia soil management group: M
Hydric soil: No
Prime farmland: All areas are prime farmland

13C—Frederick silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands (fig. 7)
Position on the landform: Summits and shoulders
Size of areas: 5 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Figure 7.—An area of Frederick silt loam, 7 to 15 percent slopes (in the foreground), and an area of Frederick silt loam, karst, 7 to 15 percent slopes (in the background).

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

13D—Frederick silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Limestone rock outcrops, in similar landform positions
- Sinkholes in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey subsoil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Frederick soil, in similar landform positions
- Soils that have a thinner surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

13E—Frederick silt loam, 25 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Soils that are shallow to limestone bedrock, on summits and shoulders
- Limestone rock outcrops, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey layer; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have a thinner surface layer than the Frederick soil, in similar landform positions
- Soils that have more chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The slope may restrict the use of some farm equipment.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

13F—Frederick silt loam, 35 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on summits and shoulders
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Soils that are shallow to limestone bedrock, on summits and shoulders
- Limestone rock outcrops, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick soil and are deeper to a clayey layer; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions
- Soils that have a thinner surface layer than the Frederick soil, in similar landform positions
- Soils that have more chert gravel in the surface layer than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

14B—Frederick silt loam, karst, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on karst uplands
Position on the landform: Summits
Size of areas: 5 to 100 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock and have common outcrops of limestone bedrock; on the rims of sinkholes
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay throughout, and are subject to flooding; in depressions

Similar components:
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Frederick soil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to grass-legume hay and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- Karst (sinkhole) areas increase the potential for ground-water contamination.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- Karst (sinkhole) areas increase the potential for ground-water contamination.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.

Septic tank absorption fields

- Sinkholes (karst areas) increase the potential for ground-water contamination from the effluent from conventional septic systems; septic systems should not be located near sinkholes.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Collapsing sinkholes may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e
Virginia soil management group: M
Hydric soil: No
Prime farmland: All areas are prime farmland

14C—Frederick silt loam, karst, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on karst uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 100 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock and have common outcrops of limestone bedrock; on the rims of sinkholes
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay throughout, and are subject to flooding; in depressions

Similar components:
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Frederick soil; in similar landform positions

- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to grass-legume hay; moderately suited to alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- Karst (sinkhole) areas increase the potential for ground-water contamination.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- Karst (sinkhole) areas increase the potential for ground-water contamination.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.

Septic tank absorption fields

- Sinkholes (karst areas) increase the potential for ground-water contamination from the effluent from conventional septic systems; septic systems should not be lcoated near sinkholes.
- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Collapsing sinkholes may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

14D—Frederick silt loam, karst, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on karst uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 100 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock and have common outcrops of limestone bedrock; on the rims of sinkholes
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay throughout, and are subject to flooding; in depressions

Similar components:
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Frederick soil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained

Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- Karst (sinkhole) areas increase the potential for ground-water contamination.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- Karst (sinkhole) areas increase the potential for ground-water contamination.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.

Septic tank absorption fields

- Sinkholes (karst areas) increase the potential for ground-water contamination from the effluent from conventional septic systems; septic systems should not be located near sinkholes.
- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Collapsing sinkholes may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

14E—Frederick silt loam, karst, 25 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on karst uplands
Position on the landform: Backslopes
Size of areas: 5 to 100 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Frederick and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock and have common outcrops of limestone bedrock; on the rims of sinkholes
- Timberville soils, which have darker colors than the Frederick soil, generally have less clay, and are subject to flooding; in depressions
- Beech Grove soils, which are very shallow to limestone bedrock; near sinkholes and rock outcrops

Similar components:
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Frederick soil; in similar landform positions
- Soils that have less clay in the subsoil than the Frederick soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High

Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.

Septic tank absorption fields

- Sinkholes (karst areas) increase the potential for ground-water contamination from the effluent from conventional septic systems; septic systems should not be located near sinkholes.
- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Collapsing sinkholes may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: M
Hydric soil: No
Prime farmland: Not prime farmland

15C—Frederick-Carbo complex, 7 to 15 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands

Position on the landform: Summits and shoulders
Size of areas: 10 to 200 acres

Map Unit Composition

Note: These Frederick and Carbo soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Frederick and similar soils: Typically 70 percent; ranging from about 60 to 80 percent
Carbo and similar soils: Typically 20 percent; ranging from about 10 to 25 percent

Typical Profile

Frederick

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Timberville soils, which have darker colors than the Frederick and Carbo soils, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Areas that have more outcrops of limestone bedrock than the Frederick and Carbo soils, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick and Carbo soils and are deeper to a clayey subsoil; in similar landform positions

Soil Properties and Qualities

Available water capacity: Frederick—moderate (about 6.8 inches); Carbo—low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Frederick—moderately high (about 0.6 in/hr); Carbo—moderately low (about 0.06 in/hr)
Depth class: Frederick—very deep (more than 60 inches); Carbo—moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Frederick—more than 60 inches; Carbo—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Frederick—moderate; Carbo—high
Runoff class: Frederick—medium; Carbo—high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- Rock outcrops may limit machinery operations.
- The bedrock and high clay content restrict the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The bedrock may restrict the rooting depth of plants.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.

- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: Frederick—M; Carbo—Y
Hydric soils: No
Prime farmland: Not prime farmland

15D—Frederick-Carbo complex, 15 to 25 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 10 to 200 acres

Map Unit Composition

Note: These Frederick and Carbo soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Frederick and similar soils: Typically 70 percent; ranging from about 60 to 80 percent
Carbo and similar soils: Typically 20 percent; ranging from about 10 to 25 percent

Typical Profile

Frederick

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Timberville soils, which have darker colors than the Frederick and Carbo soils, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways

- Areas that have more outcrops of limestone bedrock than the Frederick and Carbo soils, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick and Carbo soils and are deeper to a clayey subsoil; in similar landform positions

Soil Properties and Qualities

Available water capacity: Frederick—moderate (about 6.8 inches); Carbo—low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Frederick—moderately high (about 0.6 in/hr); Carbo—moderately low (about 0.06 in/hr)
Depth class: Frederick—very deep (more than 60 inches); Carbo—moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Frederick—more than 60 inches; Carbo—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Frederick—moderate; Carbo—high
Runoff class: Frederick—high; Carbo—very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- Rock outcrops may limit machinery operations.
- The bedrock and high clay content restrict the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The bedrock may restrict the rooting depth of plants.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.

- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: Frederick—M; Carbo—Y
Hydric soils: No
Prime farmland: Not prime farmland

15E—Frederick-Carbo complex, 25 to 35 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 10 to 200 acres

Map Unit Composition

Note: These Frederick and Carbo soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Frederick and similar soils: Typically 65 percent; ranging from about 50 to 80 percent
Carbo and similar soils: Typically 30 percent; ranging from about 20 to 50 percent

Typical Profile

Frederick

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Timberville soils, which have darker colors than the Frederick and Carbo soils, generally have less clay in the subsoil, and are subject to flooding; on footslopes, in depressions, and in low-lying areas adjacent to drainageways
- Areas that have more outcrops of limestone bedrock than the Frederick and Carbo soils, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick and Carbo soils and are deeper to a clayey subsoil; in similar landform positions

Soil Properties and Qualities

Available water capacity: Frederick—moderate (about 6.8 inches); Carbo—low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Frederick—moderately high (about 0.6 in/hr); Carbo—moderately low (about 0.06 in/hr)
Depth class: Frederick—very deep (more than 60 inches); Carbo—moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Frederick—more than 60 inches; Carbo—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Frederick—moderate; Carbo—high
Runoff class: Frederick—high; Carbo—very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope and may restrict the use of some farm equipment.
- The bedrock may restrict the rooting depth of plants.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: Frederick—M; Carbo—Y
Hydric soils: No
Prime farmland: Not prime farmland

15F—Frederick-Carbo complex, 35 to 60 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 10 to 200 acres

Map Unit Composition

Note: These Frederick and Carbo soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping. About 0.1 to 2.0 percent of the surface is covered with outcrops of limestone bedrock.

Frederick and similar soils: Typically 65 percent; ranging from about 50 to 80 percent
Carbo and similar soils: Typically 30 percent; ranging from about 20 to 50 percent

Typical Profile

Frederick

Surface layer:
0 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 43 inches—yellowish red clay
43 to 62 inches—red gravelly clay

Carbo

Surface layer:
0 to 3 inches—brown silt loam

Subsoil:
3 to 8 inches—dark yellowish brown silty clay loam
8 to 20 inches—strong brown clay; black manganese coatings
20 to 28 inches—yellowish red clay; black manganese coatings

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Beech Grove soils, which are very shallow to limestone bedrock; in similar landform positions
- Areas that have more outcrops of limestone bedrock than the Frederick and Carbo soils, in similar landform positions

Similar components:
- Watahala soils, which have more chert gravel in the upper part of the subsoil and on the soil surface than the Frederick and Carbo soils and are deeper to a clayey subsoil; in similar landform positions

Soil Properties and Qualities

Available water capacity: Frederick—moderate (about 6.8 inches); Carbo—low (about 3.8 inches)
Slowest saturated hydraulic conductivity: Frederick—moderately high (about 0.6 in/hr); Carbo—moderately low (about 0.06 in/hr)

Depth class: Frederick—very deep (more than 60 inches); Carbo—mderately deep (20 to 40 inches)
Depth to root-restrictive feature: Frederick—more than 60 inches; Carbo—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Frederick—moderate; Carbo—high
Runoff class: Frederick—high; Carbo—very high
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The low soil strength may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment and restricts the use of equipment for site preparation to the drier periods.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.

- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Frederick—M; Carbo—Y
Hydric soils: No
Prime farmland: Not prime farmland

16C—Gilpin silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 50 acres

Map Unit Composition

Gilpin and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Wallen soils, which have more rock fragments and more sand in the subsoil than the Gilpin soil; in similar landform positions near areas of sandstone bedrock
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Colluvial soils, which are very deep to bedrock and have many stones on the surface; in drainageways and on head slopes

Similar components:
- Berks soils, which have more rock fragments in the subsoil than the Gilpin soil; in similar landform positions
- Soils that have more sand and less silt in the subsoil than the Gilpin soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 4.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The bedrock restricts the rooting depth of crops.
- The limited available water capacity may cause plants to suffer from moisture stress.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e

Virginia soil management group: U
Hydric soil: No
Prime farmland: Not prime farmland

16D—Gilpin silt loam, 15 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 80 acres

Map Unit Composition

Gilpin and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Wallen soils, which have more rock fragments and more sand in the subsoil than the Gilpin soil; on summits and shoulders in areas of sandstone bedrock
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Colluvial soils, which are very deep to bedrock and have many stones on the surface; in drainageways and on head slopes

Similar components:
- Berks soils, which have more rock fragments in the subsoil than the Gilpin soil; in similar landform positions
- Soils that have more sand and less silt in the subsoil than the Gilpin soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 4.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High

Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The slope may restrict the use of some farm equipment.
- The limited available water capacity may cause plants to suffer from moisture stress during the drier summer months.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: U
Hydric soil: No
Prime farmland: Not prime farmland

16E—Gilpin silt loam, 35 to 55 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills and mountains on uplands

Position on the landform: Backslopes
Size of areas: 10 to 200 acres

Map Unit Composition

Gilpin and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Wallen soils, which have more rock fragments and more sand in the subsoil than the Gilpin soil, are in areas of sandstone bedrock, and generally are on shoulders
- Weikert soils, which are shallow to shale bedrock and are in landform positions similar to those of the Gilpin soil
- Colluvial soils that are very deep to bedrock, that have many stones on the surface, and that are in drainageways and on head slopes

Similar components:
- Berks soils, which have more rock fragments in the subsoil and are in landform positions similar to those of the Gilpin soil
- Soils that have more sand and less silt in the subsoil than the Gilpin soil and that are in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 4.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: U
Hydric soil: No
Prime farmland: Not prime farmland

17D—Gilpin-Berks complex, 15 to 35 percent slopes

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Note: These Gilpin and Berks soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Gilpin and similar soils: Typically 80 percent; ranging from about 65 to 90 percent
Berks and similar soils: Typically 15 percent; ranging from about 5 to 30 percent

Typical Profile

Gilpin

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Alticrest soils, which have less clay and more sand in the subsoil than the Gilpin and Berks soils; on shoulders and summits in areas of sandstone bedrock
- Pineville soils, which are very deep to bedrock; on head slopes, on footslopes, and in drainageways
- Bethesda, Fairpoint, and Sewell soils, which are very deep to bedrock; on strip-mined benches and outslopes
- Rock outcrops of sandstone bedrock, in similar landform positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Soils that are deep to shale bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Gilpin—low (about 4.4 inches); Berks—very low (about 2.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Gilpin—20 to 40 inches to bedrock (paralithic); Berks—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Moderately suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope and may restrict the use of some farm equipment.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: Gilpin—U; Berks—JJ
Hydric soils: No
Prime farmland: Not prime farmland

17E—Gilpin-Berks complex, 35 to 55 percent slopes

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 50 to 500 acres

Map Unit Composition

Note: These Gilpin and Berks soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Gilpin and similar soils: Typically 70 percent; ranging from about 55 to 80 percent
Berks and similar soils: Typically 25 percent; ranging from about 10 to 35 percent

Typical Profile

Gilpin

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Alticrest soils, which have less clay and more sand in the subsoil than the Gilpin and Berks soils; on shoulders and summits in areas of sandstone bedrock
- Pineville soils, which are very deep to bedrock; on head slopes, on footslopes, and in drainageways
- Bethesda, Fairpoint, and Sewell soils, which are very deep to bedrock; on strip-mined benches and outslopes
- Rock outcrops of sandstone bedrock, in similar landform positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Soils that are deep to shale bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Gilpin—low (about 4.4 inches); Berks—very low (about 2.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)

Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Gilpin—20 to 40 inches to bedrock (paralithic); Berks—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Gilpin—U; Berks—JJ
Hydric soils: No
Prime farmland: Not prime farmland

17F—Gilpin-Berks complex, 55 to 70 percent slopes

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 75 to 300 acres

Map Unit Composition

Note: These Gilpin and Berks soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Gilpin and similar soils: Typically 60 percent; ranging from about 45 to 70 percent
Berks and similar soils: Typically 35 percent; ranging from about 20 to 45 percent

Typical Profile

Gilpin

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 5 inches—yellowish brown silt loam
5 to 19 inches—yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam; strong brown mottles

Soft bedrock:
29 inches—shale bedrock

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Alticrest soils, which have less clay and more sand in the subsoil than the Gilpin and Berks soils; on shoulders and summits in areas of sandstone bedrock
- Pineville soils, which are very deep to bedrock; on head slopes, on footslopes, and in drainageways
- Bethesda, Fairpoint, and Sewell soils, which are very deep to bedrock; on strip-mined benches and outslopes
- Rock outcrops of sandstone bedrock, in similar landform positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Soils that are deep to shale bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Gilpin—low (about 4.4 inches); Berks—very low (about 2.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Gilpin—20 to 40 inches to bedrock (paralithic); Berks—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty of constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- The low soil strength is unfavorable for supporting heavy loads.

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Gilpin—U; Berks—JJ
Hydric soils: No
Prime farmland: Not prime farmland

18A—Holly loam, 0 to 2 percent slopes, frequently flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Floodplains along small creeks in valleys
Position on the landform: Floodplain steps and backswamps
Size of areas: 5 to 50 acres

Map Unit Composition

Holly and similar soils: Typically 95 percent; ranging from about 90 to 98 percent

Typical Profile

Surface layer:
0 to 4 inches—dark gray loam; yellowish red masses of oxidized iron

Subsoil:
4 to 10 inches—gray loam; strong brown masses of oxidized iron
10 to 34 inches—dark gray loam; strong brown masses of oxidized iron

Substratum:
34 to 62 inches—dark gray loam

Minor Components

Dissimilar components:
- Lobdell soils, which are moderately well drained; in the slightly higher landform positions
- Chagrin soils, which are well drained; in the slightly higher landform positions
- Timberville soils, which are well drained and have more clay in the subsoil than the Holly soil; on colluvial footslopes and in colluvial drainageways

Similar components:
- Orrville soils, which are somewhat poorly drained; in the slightly higher landform positions
- Soils that have more sand and less clay in the subsoil than the Holly soil, in similar landform positions
- Soils that have less sand and more silt, clay, or both in the subsoil than the Holly soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: High (about 10.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches

Drainage class: Poorly drained
Depth to seasonal water saturation: About 0 to 12 inches
Water table kind: Apparent
Flooding hazard: Frequent
Ponding hazard: Occasional
Depth of ponding: 0.3 to 1.0 foot
Shrink-swell potential: Low
Runoff class: Negligible
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

Suitability: Poorly suited
- Flooding may damage pastures.
- The seasonal high water table can affect equipment use, grazing patterns, and viability of grass and legume species.
- Frost action may damage the root systems of plants.

Woodland

Suitability: Poorly suited to sweetgum
- Flooding may damage haul roads.
- The low soil strength interferes with the construction of haul roads and log landings.
- Flooding and ponding restricts the safe use of roads by log trucks.
- Soil wetness may limit the use of log trucks.

Building sites

- Because of the flooding and ponding, this soil is unsuited to building site development.

Septic tank absorption fields

- Because of the flooding and ponding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- The low soil strength may cause structural damage to local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6w
Virginia soil management group: NN
Hydric soil: Yes
Prime farmland: Not prime farmland

19E—Itmann extremely channery sandy loam, 0 to 80 percent slopes

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Areas used as dumps for waste material from deep-mined coal; some areas contain reservoirs which have fluctuating water levels
Position on the landform: Mine dumps, including tailings and tipples (the Itmann soil consists of the material in the mine dumps; tailings and tipples are inclusions)
Size of areas: 5 to 30 acres
Note: Mine dumps contain impure coal; carbolithic fragments or other dark, shaly material; red dog, or the residue of impure coal that has been burned; and other waste from deep-mined coal

Map Unit Composition

Itmann and similar soils: Typically 95 percent; ranging from about 90 to 100 percent

Typical Profile

Substratum:
0 to 37 inches—black and very dark grayish brown extremely channery sandy loam; white and olive-yellow mottles
37 to 62 inches—very dark grayish brown and black extremely channery sandy loam

Minor Components

Dissimilar components:
- Bethesda soils, which have lighter colors and more fine-grained material than the Itmann soil and and have dominantly light-colored shale rock fragments; on reclaimed strip-mined benches, outslopes, and hillslopes that have their approximate original contour
- Sewell soils, which have lighter colors than the Itmann soil and have dominantly brown sandstone rock fragments; on reclaimed, strip-mined benches, outslopes, and hillslopes that have their approximate original contour
- Fairpoint soils, which have less acid than the Itmann soil, have lighter colors, have more fine-grained material, and have dominantly light-colored shale rock fragments; on reclaimed, strip-mined benches, outslopes, and hillslopes that have their approximate original contour
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent undisturbed hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent undisturbed hillslopes
- Pineville soils, which formed in very deep colluvium, have lighter colors than the Itmann soil, and are cooler during the warmer parts of the year; in drainageways and on undisturbed footslopes
- Tailing ponds, in areas scattered throughout the map unit

Similar components:
- Finely pulverized coal and shale that were washed from mined coal during preparation, in and around tailing ponds
- Tipples, which consist of buildings and equipment used for collecting coal from loaded coal cars or conveyor belts
- Tailings, which consist of finely pulverized coal and shale washed from mined coal during preparation and later deposited in basins or tailing ponds

Soil Properties and Qualities

Available water capacity: Very low (about 0.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Acid waste materials from deep-mined coal, which contain coal and black or dark-colored shale and siltstone
Distinctive soil property: This soil is subject to differential settling

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to Virginia pine and pitch pine
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- Because of differential settling, this soil is not recommended for building site development.

Septic tank absorption fields

- Because of differential settling, this soil is not recommended for septic tank absorption fields.

Local roads and streets

- Differential settling of the soil may damage local roads and streets.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e

Virginia soil management group: JJ
Hydric soil: No
Prime farmland: Not prime farmland

20D—Jefferson loam, 15 to 35 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 5 to 75 acres

Map Unit Composition

Jefferson and similar soils: Typically 85 percent; ranging from about 70 to 95 percent

Typical Profile

Surface layer:
0 to 4 inches—brown loam

Subsoil:
4 to 11 inches—dark yellowish brown loam
11 to 23 inches—strong brown clay loam
23 to 42 inches—yellowish brown clay loam
42 to 62 inches—yellowish brown gravelly clay loam; light yellowish brown iron depletions

Minor Components

Dissimilar components:
- Oriskany soils, which have more rock fragments in the subsoil and on the soil surface than the Jefferson soil; in similar or higher landform positions
- Gilpin soils, which are moderately deep to shale bedrock; on hills
- Escatawba soils, which have a seasonal water table at a depth of 30 to 48 inches; in similar or lower landform positions

Similar components:
- Tumbling soils, which have more clay in the subsoil than the Jefferson soil; in similar landform positions
- Areas that are less stony than the Jefferson soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 0.1 to 3.0 percent subrounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- The low soil strength may cause structural damage to local roads and streets.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s
Virginia soil management group: L
Hydric soil: No
Prime farmland: Not prime farmland

21A—Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Floodplains along small creeks in valleys
Position on the landform: Floodplain steps
Size of areas: 5 to 40 acres

Map Unit Composition

Note: These Lobdell and Orrville soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Lobdell and similar soils: Typically 65 percent; ranging from about 55 to 75 percent
Orrville and similar soils: Typically 30 percent; ranging from about 20 to 40 percent

Typical Profile

Lobdell

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 20 inches—yellowish brown silt loam; pale brown iron depletions and yellowish brown masses of oxidized iron
20 to 35 inches—yellowish brown loam; light gray iron depletions and yellowish brown masses of oxidized iron
35 to 48 inches—brown loam; yellowish brown masses of oxidized iron and light gray iron depletions

Substratum:
48 to 62 inches—light brownish gray and yellowish brown loam; very dark brown manganese masses

Orrville

Surface layer:
0 to 6 inches—dark grayish brown loam

Subsoil:
6 to 13 inches—yellowish brown loam; strong brown masses of oxidized iron and grayish brown iron depletions
13 to 28 inches—grayish brown loam; strong brown masses of oxidized iron
28 to 34 inches—grayish brown loam; brownish yellow masses of oxidized iron

Substratum:
34 to 47 inches—gray loam; brownish yellow masses of oxidized iron
47 to 62 inches—dark gray sandy loam

Minor Components

Dissimilar components:
- Pope soils, which are well drained and have less clay in the subsoil than the Lobdell and Orrville soils; in landform positions closer to creek banks
- Timberville soils, which are well drained and have more clay in the subsoil than the Lobdell and Orrville soils; on colluvial footslopes and in colluvial drainageways
- Chagrin soils, which are well drained; in similar landform positions

Similar components:
- Holly soils, which are poorly drained; in the slightly lower landform positions
- Soils that have less clay in the soil profile than the Lobdell and Orrville soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Lobdell—high (about 10.5 inches); Orrville—high (about 10.3 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Lobdell—moderately well drained; Orrville—somewhat poorly drained
Depth to seasonal water saturation: Lobdell—about 24 to 42 inches; Orrville—about 12 to 30 inches
Water table kind: Apparent
Flooding hazard: Occasional
Ponding hazard: None

Shrink-swell potential: Low
Runoff class: Lobdell—low; Orrville—very high
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn and grass-legume hay; poorly suited to tobacco; not suited to alfalfa hay
- Frost action may damage the root system of winter grain crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.
- Flooding may damage crops.

Pastureland

Suitability: Well suited
- Flooding may damage pastures.
- Frost action may damage the root systems of plants.

Woodland

Suitability: Moderately suited to yellow-poplar
- Flooding may damage haul roads.
- The low soil strength interferes with the construction of haul roads and log landings.
- Flooding restricts the safe use of roads by log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of the flooding, these soils are unsuited to building site development.

Septic tank absorption fields

- Because of the flooding, these soils are unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Lobdell—2w; Orrville—4w
Virginia soil management group: Lobdell—G; Orrville—HH
Hydric soils: No
Prime farmland: All areas are prime farmland

22C—Oriskany cobbly loam, 7 to 15 percent slopes, extremely stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Oriskany and similar soils: Typically 90 percent; ranging from about 75 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark yellowish brown cobbly loam

Subsoil:
2 to 12 inches—strong brown very cobbly loam
12 to 35 inches—strong brown very cobbly clay loam
35 to 62 inches—very pale brown, yellowish red, and strong brown very cobbly loam

Minor Components

Dissimilar components:
- Escatawba soils, which have a seasonal high water table at a depth of 30 to 48 inches; in lower landform positions
- Tumbling soils, which have more clay and fewer rock fragments in the subsoil than the Oriskany soil; in similar or lower landform positions
- Gilpin soils, which are moderately deep to shale bedrock; on hills
- Wallen soils, which are moderately deep to sandstone bedrock; on hills
- Jefferson soils, which have fewer rock fragments in the subsoil and on the soil surface than the Oriskany soil; in similar or lower landform positions

Similar components:
- Areas that are stonier than the Oriskany soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: About 3 to 14 percent subrounded stones; about 0 to 1 percent subrounded boulders
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The use of mechanical planting equipment is impractical and the use of equipment

during site preparation for planting or seeding is restricted because of the content of rock fragments.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s
Virginia soil management group: CC
Hydric soil: No
Prime farmland: Not prime farmland

22E—Oriskany cobbly loam, 35 to 55 percent slopes, extremely stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and mountains and areas on hills and mountains (fig. 8)
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 25 to 200 acres

Map Unit Composition

Oriskany and similar soils: Typically 90 percent; ranging from about 75 to 98 percent

Typical Profile

Surface layer:
0 to 2 inches—dark yellowish brown cobbly loam

Subsoil:
2 to 12 inches—strong brown very cobbly loam
12 to 35 inches—strong brown very cobbly clay loam
35 to 62 inches—very pale brown, yellowish red, and strong brown very cobbly loam

Minor Components

Dissimilar components:
- Escatawba soils, which have a seasonal high water table at a depth of 30 to 48 inches; in lower landform positions
- Tumbling soils, which have more clay and fewer rock fragments in the subsoil than the Oriskany soil; in similar or lower landform positions
- Gilpin soils, which are moderately deep to shale bedrock; on hills
- Wallen soils, which are moderately deep to sandstone bedrock; on hills

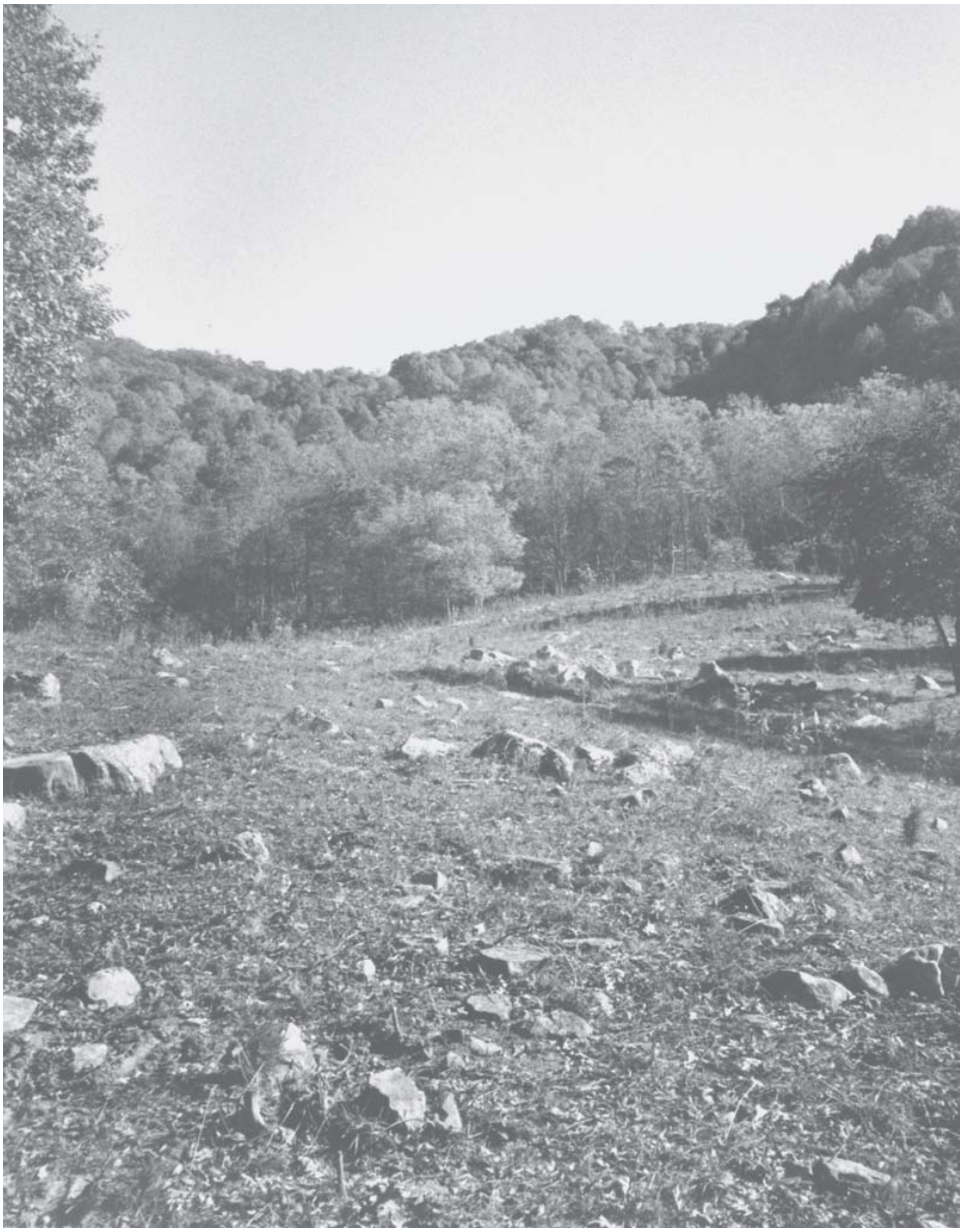

Figure 8.—An area of Oriskany cobbly loam, 35 to 55 percent slopes, extremely stony, at the base of Powell Mountain. Many subrounded rock fragments are on the soil surface.

- Jefferson soils, which have fewer rock fragments in the subsoil and on the soil surface than the Oriskany soil; in similar or lower landform positions

Similar components:
- Areas that are stonier than the Oriskany soil, in similar landform positions
- Areas that have slopes of 15 to 35 percent, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)

Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 3 to 14 percent subrounded stones; about 0 to 1 percent subrounded boulders
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Because of the content of rock fragments, the use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: CC
Hydric soil: No
Prime farmland: Not prime farmland

23A—Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Floodplains along small creeks in valleys
Position on the landform: Floodplain steps
Size of areas: 5 to 25 acres

Map Unit Composition

Philo and similar soils: Typically 95 percent; ranging from about 75 to 98 percent

Typical Profile

Surface layer:
0 to 8 inches—brown fine sandy loam

Subsoil:
8 to 16 inches—dark yellowish brown fine sandy loam
16 to 30 inches—yellowish brown fine sandy loam; grayish brown iron depletions

Substratum:
30 to 62 inches—light olive brown sandy loam; yellowish brown masses of oxidized iron and dark grayish brown iron depletions

Minor Components

Dissimilar components:
- Pope soils, which are well drained; in slightly higher landform positions
- Allegheny soils, which are well drained, have more clay in the subsoil than the Philo soil, and are less susceptible to flooding; on the higher landforms of low terraces
- Gilpin soils, which are moderately deep to bedrock; on adjacent hills
- Soils that are poorly drained, in slightly lower landform positions

Similar components:
- Soils that are somewhat poorly drained, in similar landform positions
- Soils that have more rock fragments in the subsoil and on the surface than the Philo soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 8.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Apparent
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very low
Surface fragments: None
Parent material: Alluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn; moderately suited to grass-legume hay; not suited to alfalfa hay
- Frost action may damage the root system of winter grain crops.
- Flooding may damage crops.

Pastureland

Suitability: Moderately suited
- Flooding may damage pastures.
- Frost action may damage the root systems of plants.

Woodland

Suitability: Moderately suited to yellow-poplar
- Flooding may damage haul roads.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.

Septic tank absorption fields

- Because of the flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2w
Virginia soil management group: H
Hydric soil: No
Prime farmland: All areas are prime farmland

24D—Pineville channery loam, 15 to 35 percent slopes, very stony

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes
Size of areas: 5 to 45 acres

Map Unit Composition

Pineville and similar soils: Typically 95 percent; ranging from about 80 to 98 percent

Typical Profile

Surface layer:
0 to 3 inches—brown channery loam

Subsoil:
3 to 9 inches—dark yellowish brown channery loam

9 to 35 inches—brown channery clay loam
35 to 52 inches—yellowish brown channery clay loam
52 to 62 inches—brownish yellow channery loam

Minor Components

Dissimilar components:
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent convex hillslopes
- Pope soils, which are susceptible to flooding; on nearly level floodplains

Similar components:
- Soils that have more rock fragments in the subsoil than the Pineville soil, in similar landform positions
- Soils that have less sand in the subsoil and fewer rock fragments in the subsoil and on the soil surface than the Pineville soil, in similar landform positions
- Soils that are deep to shale bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 5.5 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 0.1 to 3.0 percent subrounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s
Virginia soil management group: L
Hydric soil: No
Prime farmland: Not prime farmland

24E—Pineville channery loam, 35 to 55 percent slopes, very stony

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Base of slopes of hills and areas on hills
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 5 to 150 acres

Map Unit Composition

Pineville and similar soils: Typically 95 percent; ranging from about 80 to 98 percent

Typical Profile

Surface layer:
0 to 3 inches—brown channery loam

Subsoil:
3 to 9 inches—dark yellowish brown channery loam
9 to 35 inches—brown channery clay loam
35 to 52 inches—yellowish brown channery clay loam
52 to 62 inches—brownish yellow channery loam

Minor Components

Dissimilar components:
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent convex hillslopes
- Pope soils, which are susceptible to flooding; on nearly level floodplains
- Bethesda, Fairpoint, and Sewell soils, which have more rock fragments in the subsoil than the Pineville soil; on benches and outslopes of reclaimed strip mines

Similar components:
- Soils that have more rock fragments in the subsoil than the Pineville soil, in similar landform positions
- Soils that have less sand in the subsoil and fewer rock fragments in the subsoil and on the soil surface than the Pineville soil, in similar landform positions
- Soils that are deep to shale bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 5.5 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)

Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 0.1 to 3.0 percent subrounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: L
Hydric soil: No
Prime farmland: Not prime farmland

25—Pits, quarries

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Areas used for gravel quarries
Size of areas: 35 to 150 acres

Map Unit Composition

Pits, quarries: Typically 95 percent; ranging from about 90 to 100 percent

Typical Profile

This miscellaneous area occurs as open excavations and rock piles in limestone gravel quarries. Because of the variability of the soil material, a typical profile is not given.

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on hills
- Beech Grove soils, which are very shallow to limestone bedrock; on hills
- Timberville soils, which are susceptible to flooding; on footslopes, in depressions, and in drainageways in valleys
- Pits that have water at the bottom
- Urban land that has asphalt, concrete, buildings, and other impervious surfaces

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of any area for specific uses.

Interpretive Groups

Land capability class: Not rated
Virginia soil management group: Not rated
Hydric soils: No
Prime farmland: Not prime farmland

26A—Pope fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Cumberland Plateau and Mountains
Landform: Floodplains along small creeks in valleys
Position on the landform: Floodplain steps
Size of areas: 5 to 25 acres

Map Unit Composition

Pope and similar soils: Typically 95 percent; ranging from about 80 to 98 percent

Typical Profile

Surface layer:
0 to 8 inches—brown fine sandy loam

Subsoil:
8 to 15 inches—brown and dark yellowish brown fine sandy loam
15 to 40 inches—dark yellowish brown fine sandy loam
40 to 51 inches—yellowish brown fine sandy loam; light yellowish brown masses of oxidized iron

Substratum:
51 to 62 inches—yellowish brown fine sandy loam; dark yellowish brown iron-manganese masses, strong brown masses of oxidized iron, and pale brown iron depletions

Minor Components

Dissimilar components:
- Allegheny soils, which are well drained, have more clay in the subsoil than the Pope soil, and are less susceptible to flooding; on the higher landforms of low terraces
- Philo soils, which are moderately well drained; in slightly lower landform positions
- Gilpin soils, which are moderately deep to bedrock; on adjacent hills
- Pineville soils, which are well drained and are very deep to bedrock; on colluvial footslopes

Similar components:
- Soils that have more rock fragments in the subsoil and on the surface than the Pope soil, in similar landform positions
- Soils that have a seasonal water table at a depth of 40 to 60 inches, in similar landform positions

Soil Properties and Qualities

Available water capacity: High (about 9.6 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very low
Surface fragments: None
Parent material: Alluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, grass-legume hay, and alfalfa hay; moderately suited to tobacco
- Flooding may damage crops.

Pastureland

Suitability: Well suited
- Flooding may damage pastures.

Woodland

Suitability: Well suited to yellow-poplar
- Flooding may damage haul roads.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.

Septic tank absorption fields

- Because of the flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 1
Virginia soil management group: A
Hydric soil: No
Prime farmland: All areas are prime farmland

27D—Poplimento-Berks complex, 15 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: These Poplimento and Berks soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Poplimento and similar soils: Typically 60 percent; ranging from about 45 to 75 percent
Berks and similar soils: Typically 30 percent; ranging from about 15 to 40 percent

Typical Profile

Poplimento

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 15 inches—dark yellowish brown silty clay loam
15 to 30 inches—yellowish brown clay
30 to 55 inches—yellowish brown clay; brownish yellow mottles and black manganese masses
55 to 62 inches—yellowish brown silty clay; light gray mottles and black manganese masses

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Frederick soils, which are redder than and more clayey in the subsoil than the Poplimento and Berks soils; in similar landform positions
- Soils that are very deep to bedrock and have a loamy subsoil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Poplimento—moderate (about 8.3 inches); Berks—very low (about 2.2 inches)
Slowest saturated hydraulic conductivity: Poplimento—moderately high (about 0.20 in/hr); Berks—moderately high (about 0.6 in/hr)
Depth class: Poplimento—very deep (more than 60 inches); Berks—moderately deep (20 to 40 inches)
Depth to root-restrictive feature: Poplimento—more than 60 inches; Berks—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Poplimento—high; Berks—low
Runoff class: High
Surface fragments: None
Parent material: Poplimento—residuum weathered from limestone and shale; Berks—residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope and may restrict the use of some farm equipment.
- The bedrock may restrict the rooting depth of plants.

Woodland

Suitability: Well suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: Poplimento—M; Berks—JJ
Hydric soils: No
Prime farmland: Not prime farmland

27E—Poplimento-Berks complex, 35 to 55 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 75 acres

Map Unit Composition

Note: These Poplimento and Berks soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Poplimento and similar soils: Typically 60 percent; ranging from about 45 to 75 percent
Berks and similar soils: Typically 30 percent; ranging from about 15 to 40 percent

Typical Profile

Poplimento

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 15 inches—dark yellowish brown silty clay loam
15 to 30 inches—yellowish brown clay
30 to 55 inches—yellowish brown clay; brownish yellow mottles and black manganese masses
55 to 62 inches—yellowish brown silty clay; light gray mottles and black manganese masses

Berks

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 5 inches—dark brown silt loam

Subsoil:
5 to 10 inches—dark yellowish brown very channery silt loam
10 to 16 inches—yellowish brown very channery silt loam

Substratum:
16 to 29 inches—yellowish brown extremely channery silt loam

Hard bedrock:
29 inches—shale bedrock

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions
- Oriskany soils, which are very deep and have many stones in the soil; on footslopes and adjacent to drainageways

Similar components:
- Weikert soils, which are shallow to shale bedrock; in similar landform positions
- Frederick soils, which are redder and more clayey in the subsoil than the Poplimento and Berks soils; in similar landform positions
- Tumbling soils, which are very deep, have more clay than the Poplimento and Berks soils, and have fewer rock fragments; on footslopes, on concave-shaped backslopes, and adjacent to drainageways
- Soils that are very deep to bedrock and have a loamy subsoil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Poplimento—moderate (about 8.3 inches); Berks—very low (about 2.2 inches)
Slowest saturated hydraulic conductivity: Poplimento—moderately high (about 0.20 in/hr); Berks—moderately high (about 0.6 in/hr)
Depth class: Poplimento—very deep (more than 60 inches); Berks—mderately deep (20 to 40 inches)
Depth to root-restrictive feature: Poplimento—more than 60 inches; Berks—20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Poplimento—high; Berks—low
Runoff class: High
Surface fragments: None
Parent material: Poplimento—residuum weathered from limestone and shale; Berks—residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Coarse textured soil layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The coarseness of the soil material may reduce the traction of wheeled harvest equipment and log trucks.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Shrinking and swelling of the soil may crack foundations and basement walls.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Poplimento—M; Berks—JJ
Hydric soils: No
Prime farmland: Not prime farmland

28B—Shottower silt loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: High stream terraces in river valleys
Position on the landform: Summits
Size of areas: 5 to 30 acres

Map Unit Composition

Shottower and similar soils: Typically 95 percent; ranging from about 90 to 99 percent

Typical Profile

Surface layer:
0 to 10 inches—dark yellowish brown silt loam

Subsoil:
10 to 18 inches—brown silty clay loam
18 to 37 inches—yellowish red clay; black manganese coatings
37 to 62 inches—red clay; black manganese coatings

Minor Components

Dissimilar components:
- Allegheny soils, which have less clay in the subsoil and browner colors than the Shottower soil and are susceptible to flooding; on low stream terraces
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions generally near outcrops of limestone bedrock
- Soils that are moderately well drained, in similar landform positions

Similar components:
- Frederick and Watahala soils, which have more chert gravel in the subsoil than the Shottower soil and formed in residuum derived from limestone; on adjacent hills
- Soils that have less clay than the Shottower soil, in similar landform positions
- Areas that contain sinkholes, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 8.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited

- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- This soil is well suited to septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2e
Virginia soil management group: O
Hydric soil: No
Prime farmland: All areas are prime farmland

28C—Shottower silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: High stream terraces in river valleys
Position on the landform: Summits and shoulders
Size of areas: 5 to 30 acres

Map Unit Composition

Shottower and similar soils: Typically 95 percent; ranging from about 90 to 99 percent

Typical Profile

Surface layer:
0 to 10 inches—dark yellowish brown silt loam

Subsoil:
10 to 18 inches—brown silty clay loam
18 to 37 inches—yellowish red clay; black manganese coatings
37 to 62 inches—red clay; black manganese coatings

Minor Components

Dissimilar components:
- Allegheny soils, which have less clay in the subsoil and browner colors than the Shottower soil and are susceptible to flooding; on low stream terraces

- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions generally near outcrops of limestone bedrock
- Soils that are moderately well drained, in similar landform positions

Similar components:
- Frederick and Watahala soils, which have more chert gravel in the subsoil than the Shottower soil and formed in residuum derived from limestone; on adjacent hills
- Soils that have less clay than the Shottower soil, in similar landform positions
- Areas that contain sinkholes, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 8.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

28D—Shottower silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: High stream terraces in river valleys
Position on the landform: Backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Shottower and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 10 inches—dark yellowish brown silt loam

Subsoil:
10 to 18 inches—brown silty clay loam
18 to 37 inches—yellowish red clay; black manganese coatings
37 to 62 inches—red clay; black manganese coatings

Minor Components

Dissimilar components:
- Allegheny soils, which have less clay in the subsoil and browner colors than the Shottower soil and are susceptible to flooding; on low stream terraces
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions generally near outcrops of limestone bedrock
- Soils that are moderately well drained, in similar landform positions

Similar components:
- Frederick and Watahala soils, which have more chert gravel in the subsoil than the Shottower soil and formed in residuum derived from limestone; on adjacent hills
- Soils that have less clay than the Shottower soil, in similar landform positions
- Areas that contain sinkholes, in similar landform positions

Soil Properties and Qualities

Available water capacity: Moderate (about 8.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of this soil as base material for local roads and streets is restricted.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

29B—Timberville silt loam, 2 to 7 percent slopes, frequently flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Valleys
Position on the landform: Footslopes, toeslopes, and drainageways
Size of areas: 5 to 30 acres

Map Unit Composition

Timberville and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 3 inches—brown silt loam
3 to 9 inches—brown silt loam; dark yellowish brown iron-manganese masses

Subsoil:
9 to 28 inches—dark yellowish brown silt loam
28 to 37 inches—dark yellowish brown silty clay loam
37 to 65 inches—strong brown clay loam

Minor Components

Dissimilar components:
- Frederick soils, which are redder and have more clay in the subsoil than the Timberville soil; on adjacent backslopes
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Timberville soil; on adjacent backslopes
- Soils that are moderately well drained, in similar landform positions
- Soils that are less susceptible to flooding than the Timberville soil, along the higher edges of delineations

Similar components:
- Chagrin soils, which have more sand in the subsoil than the Timberville soil and are subject to flooding of longer duration; on floodplains

Soil Properties and Qualities

Available water capacity: High (about 10.3 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Frequent
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.
- Frequent flooding restricts the use of winter grain crops.
- Flooding may damage crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- Flooding may damage pastures.

Woodland

Suitability: Well suited to northern red oak
- Flooding may damage haul roads.
- The low soil strength interferes with the construction of haul roads and log landings.
- Flooding restricts the safe use of roads by log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.

Septic tank absorption fields

- Because of the flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Flooding may damage local roads and streets.
- The low soil strength may cause structural damage to local roads and streets.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 2w
Virginia soil management group: G
Hydric soil: No
Prime farmland: Not prime farmland

29C—Timberville silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and areas in valleys (fig. 9)
Position on the landform: Footslopes, toeslopes, and drainageways
Size of areas: 5 to 30 acres

Figure 9.—An area of Timberville silt loam, 7 to 15 percent slopes, in a depression. Frederick gravelly loam, 15 to 25 percent slopes, is on the hills in the background.

Map Unit Composition

Timberville and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 3 inches—brown silt loam
3 to 9 inches—brown silt loam; dark yellowish brown iron-manganese masses

Subsoil:
9 to 28 inches—dark yellowish brown silt loam
28 to 37 inches—dark yellowish brown silty clay loam
37 to 65 inches—strong brown clay loam

Minor Components

Dissimilar components:
- Frederick soils, which are redder and have more clay in the subsoil than the Timberville soil; on adjacent backslopes
- Watahala soils, which have more chert gravel in the subsoil and on the soil surface than the Timberville soil; on adjacent backslopes
- Soils that are moderately well drained, in similar landform positions
- Soils that are less susceptible to flooding than the Timberville soil, along the higher edges of delineations

Similar components:
- Chagrin soils, which have more sand in the subsoil than the Timberville soil and are subject to flooding of longer duration; on floodplains

Soil Properties and Qualities

Available water capacity: High (about 10.3 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.
- The risk of compaction increases when the soil is wet.
- Soil crusting results in a decrease in water infiltration and hinders the emergence of seedlings.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Well suited to northern red oak
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- The low soil strength may cause structural damage to local roads and streets.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: G
Hydric soil: No
Prime farmland: Not prime farmland

30C—Tumbling loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 5 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 8 inches—brown loam
8 to 14 inches—yellowish red gravelly clay loam
14 to 20 inches—red gravelly clay
20 to 61 inches—red gravelly clay; brown, yellowish brown, and strong brown mottles

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in lower landform positions near outcrops of limestone bedrock
- Escatawba soils, which have a seasonal high water between depths of 30 and 48 inches; in similar landform positions
- Soils that have a seasonal high water table between depths of 18 and 36 inches, in similar landform positions

Similar components:
- Jefferson soils, which have less clay in the subsoil than the Tumbling soil; in similar landform positions
- Frederick soils, which do not have any sandstone fragments; in similar landform positions
- Areas that have more stones on the surface than the Tumbling soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 5.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None

Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to grass-legume hay; moderately suited to corn, tobacco, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- This soil is well suited to haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

30D—Tumbling loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes
Size of areas: 5 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 8 inches—brown loam
8 to 14 inches—yellowish red gravelly clay loam
14 to 20 inches—red gravelly clay
20 to 61 inches—red gravelly clay; brown, yellowish brown, and strong brown mottles

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in lower landform positions near outcrops of limestone bedrock
- Escatawba soils, which have a seasonal high water between depths of 30 and 48 inches; in similar landform positions
- Soils that have a seasonal high water table between depths of 18 and 36 inches, in similar landform positions

Similar components:
- Jefferson soils, which have less clay in the subsoil than the Tumbling soil; in similar landform positions
- Frederick soils, which do not have any sandstone fragments; in similar landform positions
- Areas that have more stones on the surface than the Tumbling soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 5.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited

- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 4e
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

31C—Tumbling loam, 7 to 15 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 5 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 90 percent; ranging from about 85 to 98 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 8 inches—brown loam
8 to 14 inches—yellowish red gravelly clay loam

14 to 20 inches—red gravelly clay
20 to 61 inches—red gravelly clay; brown, yellowish brown, and strong brown mottles

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on backslopes near outcrops of limestone bedrock
- Escatawba soils, which have a seasonal high water between depths of 30 and 48 inches; in similar landform positions
- Soils that have a seasonal high water table between depths of 18 and 36 inches, in similar landform positions

Similar components:
- Jefferson soils, which have less clay in the subsoil than the Tumbling soil; in similar landform positions
- Areas that have fewer stones on the surface than the Tumbling soil, in similar landform positions

Soil Properties and Qualities

Available water capacity: Low (about 5.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 0.1 to 3.0 percent rounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- Large stones on the surface may restrict the operation of some farm machinery.

Woodland

Suitability: Moderately suited to northern red oak
- This soil is well suited to haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.

- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6s
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

31D—Tumbling loam, 15 to 25 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes
Size of areas: 5 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 90 percent; ranging from about 85 to 98 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 8 inches—brown loam
8 to 14 inches—yellowish red gravelly clay loam
14 to 20 inches—red gravelly clay
20 to 61 inches—red gravelly clay; brown, yellowish brown, and strong brown mottles

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on backslopes near outcrops of limestone bedrock
- Berks and Gilpin soils, which are moderately deep to shale bedrock; on backslopes
- Weikert soils, which are shallow to shale bedrock; on backslopes
- Wallen and Alticrest soils, which are moderately deep to sandstone bedrock; on backslopes
- Oriskany soils, which have more rock fragments in the soil and on the surface than the Tumbling soil; in similar landform positions
- Escatawba soils, which have a seasonal high water between depths of 30 and 48 inches; in similar landform positions

Similar components:
- Jefferson soils, which have less clay in the subsoil than the Tumbling soil; in similar landform positions

- Poplimento soils, which have few shale channers and generally have less sand than the Tumbling soil; in similar landform positions that are generally convex shaped
- Areas that have fewer stones on the surface than the Tumbling soil, in similar landform positions
- Areas that have steeper slopes than the Tumbling soil

Soil Properties and Qualities

Available water capacity: Low (about 5.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: About 0.1 to 3.0 percent rounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding and may restrict the use of some mechanical planting equipment.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s

Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

31E—Tumbling loam, 25 to 35 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Base of slopes of hills and mountains and areas on hills and mountains
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 5 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 90 percent; ranging from about 85 to 98 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 8 inches—brown loam
8 to 14 inches—yellowish red gravelly clay loam
14 to 20 inches—red gravelly clay
20 to 61 inches—red gravelly clay; brown, yellowish brown, and strong brown mottles

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on backslopes near outcrops of limestone bedrock
- Berks and Gilpin soils, which are moderately deep to shale bedrock; on backslopes
- Weikert soils, which are shallow to shale bedrock; on backslopes
- Wallen and Alticrest soils, which are moderately deep to sandstone bedrock; on backslopes
- Oriskany soils, which have more rock fragments in the soil and on the surface than the Tumbling soil; in similar landform positions
- Escatawba soils, which have a seasonal high water between depths of 30 and 48 inches; in similar landform positions

Similar components:
- Jefferson soils, which have less clay in the subsoil than the Tumbling soil; in similar landform positions
- Poplimento soils, which have few shale channers and generally have less sand than the Tumbling soil; in similar landform positions that are generally convex shaped
- Areas that have fewer stones on the surface than the Tumbling soil, in similar landform positions
- Areas that have steeper slopes than the Tumbling soil

Soil Properties and Qualities

Available water capacity: Low (about 5.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: More than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: About 0.1 to 3.0 percent rounded stones
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pastureland

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The use of equipment during site preparation for planting or seeding is restricted because of the rock fragments.
- The low soil strength may create unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s
Virginia soil management group: O
Hydric soil: No
Prime farmland: Not prime farmland

32—Udorthents

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Cut and fill areas on hills and areas in valleys

Position on the landform: Cut and fill areas on summits, shoulders, backslopes, footslopes, and toeslopes that have been disturbed in land use activities
Slope: Typically 0 to 45 percent; more than 45 percent in a few areas
Size of areas: 5 to 50 acres

Map Unit Composition

Udorthents and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Udorthents have resulted from disturbance of soil by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from severely compacted to slightly compacted. Slopes are variable. Because of the variability of the soil material, a typical pedon is not given.

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on hills
- Timberville soils, which are subject to flooding; on footslopes, in depressions, and in drainageways in valleys
- Frederick and Watahala soils, which are very deep to limestone bedrock; on hills
- Urban land, which consists of areas covered by asphalt, concrete, buildings, and other impervious surfaces

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of any area for specific uses.

Interpretive Groups

Land capability class: Not rated
Virginia soil management group: Not rated
Hydric soils: No
Prime farmland: Not prime farmland

33—Urban land-Udorthents complex

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Cut and fills areas on hills and in valleys and areas covered with buildings and pavement
Position on the landform: Cut and fills areas on summits, shoulders, backslopes, toeslopes, and floodplains in areas which contain materials such as concrete, asphalt, buildings, and fill material; such areas are in the towns of Jonesville and Pennington Gap and in small airports
Slope: Generally 0 to 45 percent
Size of areas: 50 to 500 acres

Map Unit Composition

Note: The Urban land and Udorthents occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Urban land: Typically 70 percent; ranging from about 65 to 75 percent
Udorthents and similar soils: Typically 20 percent; ranging from about 15 to 25 percent

Typical Profile

Urban land

This part of the map unit consists of areas covered by asphalt or concrete, such as roadways, airport runways, or parking lots. Also included are structures, buildings, and other impervious surfaces. Because of the variability of materials, a typical profile is not given.

Udorthents

Udorthents have resulted from disturbance of soil by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from severely compacted to slightly compacted. Slopes are variable. Because of the variability of the soil material, a typical profile is not given.

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; on hills
- Timberville soils, which are susceptible to flooding; on footslopes, in depressions, and in drainageways in valleys
- Frederick and Watahala soils, which are very deep to limestone bedrock; on hills
- Low areas or depressions that contain water

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of any area for specific uses.

Interpretive Groups

Land capability class: Not rated
Virginia soil management group: Not rated
Hydric soils: No
Prime farmland: Not prime farmland

34D—Wallen-Alticrest complex, 15 to 35 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Mountains on uplands (fig. 10)
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 80 acres

Map Unit Composition

Note: These Wallen and Alticrest soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wallen and similar soils: Typically 55 percent; ranging from about 40 to 65 percent
Alticrest and similar soils: Typically 35 percent; ranging from about 20 to 45 percent

Typical Profile

Wallen

Organic layer:
0 to 1 inch—moderately decomposed plant material

Figure 10.—An area of Wallen-Alticrest complex, 15 to 35 percent slopes, very stony, on the summit of Wallen Ridge (northwest of Stickleyville).

Surface layer:
1 to 2 inches—dark yellowish brown gravelly loam

Subsoil:
2 to 26 inches—yellowish brown very gravelly loam

Hard bedrock:
26 inches—sandstone bedrock

Alticrest

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown fine sandy loam

Subsoil:
3 to 5 inches—dark yellowish brown sandy loam
5 to 17 inches—yellowish brown sandy loam
17 to 27 inches—strong brown sandy loam

Substratum:
27 to 30 inches—strong brown loamy sand

Hard bedrock:
30 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Gilpin soils, which have more clay in the subsoil than the Wallen and Alticrest soils and are in areas of shale bedrock; in similar landform positions, generally at the lowest elevations in the map unit
- Outcrops of sandstone bedrock, in similar landform positions

Similar components:
- Soils that have more clay in the subsoil than the Wallen and Alticrest soils and that are in areas of sandstone bedrock, in similar landform positions
- Soils that are shallow to sandstone bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Wallen—very low (about 2.4 inches); Alticrest—low (about 3.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Residuum weathered from sandstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted because of the content of rock fragments.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

- The high content of sand or gravel in the soil increases sloughing and causes cutbanks to be more susceptible to caving.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7s
Virginia soil management group: Wallen—JJ; Alticrest—FF
Hydric soils: No
Prime farmland: Not prime farmland

34E—Wallen-Alticrest complex, 35 to 55 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 5 to 750 acres

Map Unit Composition

Note: These Wallen and Alticrest soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wallen and similar soils: Typically 55 percent; ranging from about 40 to 65 percent
Alticrest and similar soils: Typically 35 percent; ranging from about 20 to 45 percent

Typical Profile

Wallen

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown gravelly loam

Subsoil:
2 to 26 inches—yellowish brown very gravelly loam

Hard bedrock:
26 inches—sandstone bedrock

Alticrest

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown fine sandy loam

Subsoil:
3 to 5 inches—dark yellowish brown sandy loam
5 to 17 inches—yellowish brown sandy loam
17 to 27 inches—strong brown sandy loam

Substratum:
27 to 30 inches—strong brown loamy sand

Hard bedrock:
30 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Gilpin soils, which have more clay in the subsoil than the Wallen and Alticrest soils and are in areas of shale bedrock; in similar landform positions, generally at the lowest elevations in the map unit
- Oriskany soils, which are very deep to bedrock; on head slopes and along drainageways
- Outcrops of sandstone bedrock, in similar landform positions

Similar components:
- Soils that have more clay in the subsoil than the Wallen and Alticrest soils and are in areas of sandstone bedrock, in similar landform positions
- Soils that are shallow to sandstone bedrock, in similar landform positions

Soil Properties and Qualities

Available water capacity: Wallen—very low (about 2.4 inches); Alticrest—low (about 3.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Residuum weathered from sandstone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.

- The use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted because of the content of rock fragments.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- The high content of sand or gravel in the soil increases sloughing and causes cutbanks to be more susceptible to caving.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: Wallen—JJ; Alticrest—FF
Hydric soils: No
Prime farmland: Not prime farmland

35F—Wallen-Rock outcrop complex, 35 to 85 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys and Cumberland Plateau and Mountains
Landform: Mountains on uplands
Position on the landform: Typically backslopes; rock outcrops are near-vertical cliffs in some areas
Size of areas: 50 to 1,000 acres

Map Unit Composition

Note: This Wallen soil and areas of Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wallen and similar soils: Typically 80 percent; ranging from about 60 to 85 percent
Rock outcrop: Typically 15 percent; ranging from about 5 to 25 percent

Typical Profile

Wallen

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 2 inches—dark yellowish brown gravelly loam

Subsoil:
2 to 26 inches—yellowish brown very gravelly loam

Hard bedrock:
26 inches—sandstone bedrock

Rock outcrop

This part of the map unit consists of outcrops of sandstone bedrock. Outcrops range from a few inches high to 50 feet high as near-vertical cliffs.

Minor Components

Dissimilar components:
- Gilpin soils, which have more clay in the subsoil than the Wallen soil and are in areas of shale bedrock; in similar landform positions, generally in the lowest areas in the map unit
- Oriskany soils, which are very deep to bedrock; at the base of rock outcrops, on head slopes, and along drainageways

Similar components:
- Alticrest soils, which have fewer rock fragments in the subsoil than the Wallen soil and are in areas of sandstone bedrock; in similar landform positions
- Soils that are shallow to sandstone bedrock, in similar landform positions

Properties and Qualities of the Wallen Soil

Available water capacity: Very low (about 2.4 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Residuum weathered from sandstone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pastureland

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- Rock fragments restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- Because of the limited depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of rock outcrops, rock removal may be needed.

Septic tank absorption fields

- Because of the limited depth to bedrock, the Wallen soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Because of rock outcrops, special design of the grade of local roads and streets and careful consideration of their location are needed to avoid rock removal.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: Wallen—7s; Rock outcrop—8s
Virginia soil management group: Wallen—JJ; Rock outcrop—none assigned
Hydric soils: No
Prime farmland: Not prime farmland

36C—Watahala-Frederick complex, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 20 acres

Map Unit Composition

Note: These Watahala and Frederick soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Watahala and similar soils: Typically 75 percent; ranging from about 70 to 85 percent
Frederick and similar soils: Typically 20 percent; ranging from about 15 to 25 percent

Typical Profile

Watahala

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown gravelly loam

Subsurface layer:
3 to 36 inches—yellowish brown gravelly loam

Subsoil:
36 to 63 inches—yellowish red clay; brownish yellow mottles

Frederick

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions, generally near outcrops of limestone bedrock
- Timberville soils, which have fewer rock fragments than the Watahala and Frederick soils, have less clay in the subsoil, and are subject to very brief flooding; in depressions, on head slopes, and in drainageways

Similar components:
- Soils that have less clay in the subsoil than the Watahala and Frederick soils, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Watahala and Frederick soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Watahala—low (about 4.7 inches); Frederick—moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Watahala—moderately high (about 0.20 in/hr); Frederick—moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Watahala—20 to 50 inches to strongly contrasting textural stratification; Frederick—more than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: Watahala—about 0.5 to 3.0 percent coarse angular gravel; Frederick—about 0.5 to 2.0 percent coarse angular gravel
Parent material: Watahala—residuum weathered from cherty limestone; Frederick—residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- The rate of surface runoff, the erosion hazard, and the amount of nutrient loss are increased because of the slope.
- The high clay content restricts the rooting depth of crops.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.

Woodland

Suitability: Moderately suited to northern red oak
- These soils are well suited to haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted because of the content of rock fragments.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 3e
Virginia soil management group: M
Hydric soils: No
Prime farmland: Not prime farmland

36D—Watahala-Frederick complex, 15 to 35 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: These Watahala and Frederick soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Watahala and similar soils: Typically 80 percent; ranging from about 75 to 85 percent
Frederick and similar soils: Typically 15 percent; ranging from about 15 to 25 percent

Typical Profile

Watahala

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown gravelly loam

Subsurface layer:
3 to 36 inches—yellowish brown gravelly loam

Subsoil:
36 to 63 inches—yellowish red clay; brownish yellow mottles

Frederick

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions, generally near outcrops of limestone bedrock
- Timberville soils, which have fewer rock fragments than the Watahala and Frederick soils, have less clay in the subsoil, and are subject to very brief flooding; in depressions, on head slopes, and in drainageways

Similar components:
- Soils that have less clay in the subsoil than the Watahala and Frederick soils, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Watahala and Frederick soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Watahala—low (about 4.7 inches); Frederick—moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Watahala—moderately high (about 0.20 in/hr); Frederick—moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Watahala—20 to 50 inches to strongly contrasting textural stratification; Frederick—more than 60 inches
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: Watahala—about 0.5 to 3.0 percent coarse angular gravel; Frederick—about 0.5 to 2.0 percent coarse angular gravel
Parent material: Watahala—residuum weathered from cherty limestone; Frederick—residuum weathered from limestone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

Suitability: Well suited
- The hazard of erosion, the rate of surface runoff, and the amount of nutrient loss are increased because of the slope.
- The slope may restrict the use of some farm equipment.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for preparing sites for planting and seeding is restricted and the use of mechanical planting equipment is impractical.
- The use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted because of the content of rock fragments.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 6e
Virginia soil management group: M
Hydric soils: No
Prime farmland: Not prime farmland

36E—Watahala-Frederick complex, 35 to 55 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 75 acres

Map Unit Composition

Note: These Watahala and Frederick soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Watahala and similar soils: Typically 80 percent; ranging from about 75 to 85 percent
Frederick and similar soils: Typically 15 percent; ranging from about 15 to 25 percent

Typical Profile

Watahala

Organic layer:
0 to 1 inch—moderately decomposed plant material

Surface layer:
1 to 3 inches—very dark grayish brown gravelly loam

Subsurface layer:
3 to 36 inches—yellowish brown gravelly loam

Subsoil:
36 to 63 inches—yellowish red clay; brownish yellow mottles

Frederick

Surface layer:
0 to 2 inches—dark brown gravelly loam
2 to 8 inches—brown gravelly loam

Subsoil:
8 to 62 inches—red clay

Minor Components

Dissimilar components:
- Carbo soils, which are moderately deep to limestone bedrock; in similar landform positions, generally near outcrops of limestone bedrock
- Timberville soils, which have fewer rock fragments than the Watahala and Frederick soils, have less clay in the subsoil, and are subject to very brief flooding; in depressions, on head slopes, and in drainageways

Similar components:
- Soils that have less clay in the subsoil than the Watahala and Frederick soils, in similar landform positions
- Soils that have fewer chert gravel in the surface layer than the Watahala and Frederick soils, in similar landform positions

Soil Properties and Qualities

Available water capacity: Watahala—low (about 4.7 inches); Frederick—moderate (about 6.8 inches)
Slowest saturated hydraulic conductivity: Watahala—moderately high (about 0.20 in/hr); Frederick—moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Watahala—20 to 50 inches to strongly contrasting textural stratification; Frederick—more than 60 inches
Drainage class: Well drained

Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: Watahala—about 0.5 to 3.0 percent coarse angular gravel; Frederick—about 0.5 to 2.0 percent coarse angular gravel
Parent material: Watahala—residuum weathered from cherty limestone; Frederick—residuum weathered from limestone

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pastureland

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak
- The slope poses safety hazards and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength interferes with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks and harvesting equipment.
- Because of the slope, the use of equipment for mechanical planting and the preparation of sites for planting and seeding is impractical.
- The use of mechanical planting equipment is impractical and the use of equipment during site preparation for planting or seeding is restricted because of the content of rock fragments.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required.
- The high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The slope limits the proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, the use of these soils as base material for local roads and streets is restricted.
- The low soil strength is unfavorable for supporting heavy loads.
- Because of the slope, designing local roads and streets is difficult.
- Frost action may damage local roads and streets.

Interpretive Groups

Land capability class: 7e
Virginia soil management group: M
Hydric soils: No
Prime farmland: Not prime farmland

W—Water

This map unit is in the major land resource areas of the Southern Appalachian Ridges and Valleys and the Cumberland Plateau and Mountains. It includes ponds, lakes, creeks, rivers, or reservoirs.

This map unit is not assigned any interpretive groups.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for agricultural waste management. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of gravel, sand, reclamation material, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Wess Stanley, District Conservationist, and Tony Rhoton, Soil Conservation Technician, Natural Resources Conservation Service, helped prepare this section.

According to the 2002 Census of Agriculture, the number of farms in Lee County has decreased since 1997 but the average size of farms has increased *(17)*. In 2002, the county had 1,103 farms and the average farm size was 116 acres. Pasture and forage acreage greatly outnumbers cropland acreage in Lee County. Livestock, burley tobacco, and forage production are the main sources of income on these farms, with livestock accounting for 55 percent of the total income, burley tobacco accounting for 35 percent, and other crops accounting for the remaining 10 percent. The dominant livestock is beef cattle. The main forage crops are grass-legume hay and pastures. Some grain crops such as corn, oats, and wheat are grown. These crops are grown mainly for livestock feed.

Some of the most productive agricultural soils in the county are Frederick, Shottower, Timberville, and Watahala. These soils are very deep to bedrock and have a higher available water capacity than soils in the county that are shallower to bedrock. Some less productive soils in the county are Carbo and Gilpin. Carbo and Gilpin soils are moderately deep to bedrock. Other soils, such as Berks and Wallen, are in areas too steep for cultivation and are not suited to agricultural purposes. Beech Grove soils are very shallow to bedrock and have a very low available water capacity; thus, they are not favorable for agricultural uses, even in areas where slopes are not as restrictive.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Effective pasture management practices include maintaining a mixture of grasses and legumes, rotating pasture, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Some general principles of management apply to all of the soils suitable for farm crops and pasture in Lee County, although individual soils or groups of soils require different kinds of management *(19)*. The general principles of management are described in the following paragraphs.

Most of the soils in the county have a moderate or low supply of plant nutrients. As a result, applications of lime and fertilizer are necessary. The amounts to be applied depend on the type of soil, the cropping history, the type of crop grown, and the desired level of yields, and they should be determined by the results of soil tests and analyses.

The content of organic matter is low in most of the cultivated soils in the county. Increasing the content is not feasible. The content can be maintained, however, by adding farm manure, by returning crop residue to the soil, and by growing sod crops, cover crops, and green manure crops.

Tillage tends to break down soil structure and should be kept to the minimum

amount necessary for preparation of a seedbed and control of weeds. Maintaining the content of organic matter in the plow layer helps to maintain soil structure.

No-till farming is becoming more common where some annual crops and new stands of grasses and legumes are established. Winter cover crops also are being included as part of no-till systems where row crops are grown. These practices help to maintain the soil structure and the content of organic matter.

Runoff and erosion occur mainly while a cultivated crop is growing or soon after it has been harvested. If cultivated, all of the soils in the county that are gently sloping or steeper are subject to erosion. A suitable cropping system that helps to control erosion is needed. In areas where such a system is applied, the main management needs are proper crop rotations, minimum tillage, mulch planting, crop residue management, cover crops and green manure crops, and applications of lime and fertilizer. Other major erosion-control measures are stripcropping and grassed waterways. The effectiveness of a particular combination of these measures differs from one soil to another. Different combinations can be equally effective on the same soil.

Erosion is a critical problem in the county on some of the soils commonly used for pasture. Additional management concerns that are difficult to overcome include the slope of the fields, rock outcrops, low fertility, encroachment of brush, and lack of adequate water sources in proper locations.

A high level of pasture management, including applications of fertilizer, controlled grazing, and proper selection of forage species, is needed to prevent excessive erosion on some soils. The best controlled grazing system is one that rotates livestock from one pasture to another and allows for regrowth of the pasture plants. Other means of controlling grazing are varying the stocking rate according to forage production at different times in the growing season, deferring grazing to provide extra time for plant growth in areas grazed in midsummer or fall, and improving the grazing distribution by providing additional sources of water.

Generally, the quality of plant species in pastured areas varies in direct proportion to the level of management. In some situations it may be necessary to provide a seed source for better quality forage plants as the overall management level is improved. This can be accomplished by providing feeding hay in areas where the ground cover is sparse or the species are undesirable. Frost seeding on steeper pastures during late winter and early spring can also be used to introduce better quality forage.

The composition of the plant species also can be improved by increasing the level of available plant nutrients in areas of soils that have adequate pH levels. Applications of phosphate in pastured areas generally result in a higher percentage of legumes.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification and the Virginia Soil Management Group of map units in the survey area also are shown in the table.

The yields are based on VALUES—the Virginia Agronomic Land Use Evaluation System *(27)*. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop

residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

Realistic yield goals can be maintained over a long-term basis through proper nutrient management and other soil amendments such as lime. Applications of nitrogen and phosphorus from organic or inorganic forms should be done according to approved nutrient management practices and regulations.

Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit *(24)*. Only capability class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e*

shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, forestland, wildlife habitat, or recreation.

The capability classification of the soils in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Virginia Soil Management Groups

The Virginia Agronomic Land Use Evaluation System (VALUES) is a system used to rank soils for management and productivity *(27)*. VALUES places each soil series in Virginia into one of 43 management groups. The format of the management groups, A through QQ, include the following soil characteristics—regional occurrence; parent material; landscape position or influence; solum thickness; dominant profile features, such as texture; available water capacity for plants; and internal soil drainage. Yields that are both economically and environmentally feasible were assigned to each management group, based on yields of field trial crop data and research. The following paragraphs describe the soil management groups in Lee County.

Group A. The soils in this group formed in alluvial parent materials and are on nearly level and gently sloping floodplains or stream terraces which have watersheds that originate west of the Blue Ridge. These soils are deep or very deep and are medium textured throughout. They have a high available water capacity and are well drained.

Group G. The soils of this group formed in locally transported, medium textured sediments of either colluvial or alluvial origin that overlie a wide range of residual materials. These soils are in landscape positions that include footslopes and toeslopes, the heads of drainageways, depressions, and narrow upland drainageways. These deep and very deep soils are silty to loamy in the upper part of the subsoil, which is underlain with clayey to stony materials. They have a moderately high available water capacity and are moderately well drained or somewhat poorly drained.

Group L. The soils of this group formed from old transported deposits of alluvium or colluvium. These soils are common on stream terraces, footslopes, and older, elevated, upland landscapes that were once stream terraces. They are deep or very deep, have medium textured surface layers, have more clayey subsurface layers, and commonly contain gravel and rounded stones. They have a moderate or high available water capacity and typically are well drained.

Group M. The soils of this group formed in material weathered from carbonate rocks. These soils are on upland summits and side slopes. These deep or very deep soils have reddish brown clayey subsurface layers that contain coarse fragments in some areas. They have a moderate available water capacity, unless the content of coarse fragments is significantly high, and they are well drained.

Group O. The soils of this group formed from transported materials ranging from mountain colluvium to old alluvium on dissected uplands and deposits on old elevated river terraces. These very deep to shallow soils have very dark red clayey subsurface layers, which have significant amounts of coarse fragments in some areas. They have a moderate available water capacity and are well drained.

Group U. The soils of this group formed from a variety of residual parent materials ranging from Triassic sediments to sandstone, shale, and limestone to colluvium from

these materials. These moderately deep to shallow soils commonly have fine-loamy subsurface layers. They commonly have coarse fragments making up one-third of the soil volume and, as a result, have a moderate or moderately low available water capacity. They are well drained or moderately well drained.

Group Y. The soils of this group formed from the residuum of weathered limestone, shale, or other carbonate-influenced rocks. These shallow to moderately deep soils represent upland landscapes. They have clayey subsurface layers, which contain coarse fragments in some areas. They have a moderate or low available water capacity where they are shallow to bedrock, and they are mostly well drained.

Group CC. The soils of this group formed from a range of parent materials that include alluvium and colluvium. These soils occur on a variety of landscapes, including uplands, stream terraces, colluvial areas, and bottom lands. They commonly have a moderately deep solum, are very deep to bedrock, have clayey-skeletal to coarse-loamy subsurface layers (which have as much as 70 percent coarse fragments in some areas), and have a moderately low available water capacity. They are well drained.

Group FF. The soils of this group formed in sandstone and shale residual parent materials and mountain colluvium. These soils are on steeply dissected uplands and mountain side slopes. They are moderately shallow and mostly have loamy-skeletal subsurface layers, which may contain 80 percent, or more, coarse fragments. As a result, the available water capacity is low or very low. The soils are well drained or moderately well drained.

Group HH. The soils of this group formed from loamy sediments on floodplains. They are moderately deep to very deep, have fine-loamy or clayey subsurface layers, have a moderate available water capacity, and are somewhat poorly drained or moderately well drained.

Group JJ. The soils of this group formed from a wide variety of residual parent materials, ranging from sandstone, shale, and limestone to phyllite or schist. These soils are shallow to moderately deep, dominantly are loamy-skeletal throughout, and contain 30 to 70 percent coarse fragments. This group includes some very deep soils if the natural soil porosity has been disturbed. The soils of this group have a very low available water capacity and are well drained.

Group NN. The soils of this group are undrained. These soils formed in alluvium along streams or on terraces. They are moderately deep to very deep, have silty to clay loam subsurface layers, have a moderately high available water capacity, and are somewhat poorly drained or poorly drained.

The management groups for the map units in the survey area are given in the section “Detailed Soil Map Units” and in table 5.

Prime Farmland

Table 6 lists the map units in the survey area that are considered prime farmland. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of prime farmland, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

Prime farmland is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed,

forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 11,600 acres in the survey area, or nearly 4 percent of the total acreage, meets the soil requirements for prime farmland. This land is mainly in the limestone valley or on the floodplains of creeks and rivers.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some of the soils in table 6, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Hydric Soils

This section lists the map units in the survey area that have a hydric soil as a major component or may include minor components that are hydric soils. This information can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site *(9, 12)*.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology *(3, 12, 14, 15)*. Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part *(5)*. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established *(6)*. These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” *(22)* and “Keys to Soil Taxonomy” *(21)* and in the “Soil Survey Manual” *(26)*.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These

visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” *(9)*.

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map unit meets the definition of hydric soils and, in addition, has at least one of the hydric soil indicators. This information can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site *(9, 12)*.

18A Holly loam, 0 to 2 percent slopes, frequently flooded

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The following map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

1A Allegheny loam, 0 to 2 percent slopes, rarely flooded
1B Allegheny loam, 2 to 7 percent slopes, rarely flooded
6E Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky
10A Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded
21A Lobdell-Orville complex, 0 to 3 percent slopes, occasionally flooded
23A Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded
29B Timberville silt loam, 2 to 7 percent slopes, frequently flooded
29C Timberville silt loam, 7 to 15 percent slopes
32 Udorthents
33 Urban land-Udorthents complex

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 7, parts I through III, show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material (the content of nitrogen commonly ranges from 10 to 30

milligrams per liter). The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has

constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of

pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Forestland Productivity and Management

Clark Boyer, Area Forester, Virginia Department of Forestry, Big Stone Gap, Virginia, helped prepare this section.

About 58 percent of Lee County, or 158,000 acres of the total land area, is forestland. These forests are a renewable resource that provides environmental, economic, recreational, and social benefits to the county. With proper management the forests can provide the desired benefits for many years. Although some past harvesting techniques and wildfires have had a negative influence on the condition of the forests in the county, proper forest management can improve the quality of future woodland. In some areas Lee County has naturally occurring, high-quality hardwoods. Primarily because of climate and natural soil fertility, Lee County has the potential to produce some of the best quality hardwoods in Virginia.

In general, the best quality timber grows on Frederick, Watahala, and Timberville soils in the limestone valley and on Jefferson, Tumbling, and Pineville soils on the lower slopes and in drainageways of mountains. The common species growing on these sites include black walnut, ash, basswood, cherry, yellow-poplar, white oak, red oak, and some maple. On the upper slopes and ridges of mountains, Wallen, Weikert, Berks, and Alticrest soils tend to support the lower quality trees. On these sites the common species include scarlet oak, black oak, chestnut oak, and some hickory.

North- and east-facing slopes are generally cooler and moister. These areas are more productive than the warmer and drier south- and west-facing slopes. Also, limestone-influenced soils tend to produce more timber than sandstone- or shale-influenced soils. Proper moisture content is the single most important factor influencing tree growth; generally, slope position and aspect can compensate for a lack of inherent fertility.

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forestland management.

Forestland Productivity

In the table 8, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the “National Forestry Manual” *(18)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forestland Management

In table 9, parts I through V, interpretive ratings are given for various aspects of forestland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of forestland management. *Well suited* indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome the undesirable soil properties.

Proper planning for timber harvesting is essential to minimize the potential impact to soil and water quality. A harvest plan should include logging roads, log decks, streamside management zones, stream crossings, skid trails, schedule of activities, and Best Management Practices (BMP’s) for each activity. Forests should be managed to increase economic and environmental benefits. A forest stewardship plan should be developed to guide management and utilization of the woodlands.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils. More detailed information about the criteria used in the ratings is available in the “National Forestry Manual” *(18)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the

surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Wildlife Habitat

William Keith, Soil Conservationist, Natural Resources Conservation Service, helped prepare this section.

Lee County has a diverse plant and animal life. The open farmlands and riparian areas of the valleys as well as the broadleaf, deciduous forests of the ridges provide habitat for a variety of species.

Among the popular upland game animals are white-tailed deer, wild turkey, ruffed grouse, bobwhite quail, squirrel, cottontail, racoon, red fox, and gray fox.

The Powell River and its tributaries provide habitat for various aquatic species. Native gamefish include smallmouth bass, rock bass, redbreast sunfish, bluegill, and catfish. Many rare and threatened species inhabit the Powell River in Lee County. The populations of freshwater mussels that were once abundant throughout the Tennessee River system are now vanishing. Some mussel species found in the Powell River are currently listed as threatened and endangered.

The karst topography of the county formed in dissolved, underlying limestone bedrock. It provides the conditions for certain unique communities, such as the “Cedars,” which is located a few miles west of Jonesville. The Beech Grove soils of the “Cedars” support an oligotrophic scrub, or “cedar glade” community. The “cedar glade” community has rare plants, such as running glade clover *(Trifolium calcaricum)*. Along with its caves, the “Cedars” also provides habitat for 17 rare, threatened, or endangered invertebrates, including the cave isopod *(Lirecus usdagalun),* which is on the Federal list of endangered species, as well as the Indiana bat *(Myotis sodalis)* and the gray bat *(Myotis griscens)*.

Recreational Development

In table 10, parts I and II, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation.

Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements, for local roads and streets, and for septic tank absorption fields.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil

properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works. Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential,

commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, reclamation material, roadfill, and topsoil; plan structures for water management; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 11, parts I and II, show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil

properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 12, parts I and II, show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 13, parts I and II, give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, part I, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material,

and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

In the table 13, part II, the rating class terms are *good, fair,* and *poor* for reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed *(23)*. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Soil Properties

Table 15 gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional

refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical Soil Properties

Table 16 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^{1}/_{3}$- or $^{1}/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility,

shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook" *(20)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Soil Properties

Table 17 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Water Features

Table 18 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top *(upper limit)* and base *(lower limit)* of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 19 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which significantly affects the ease of excavation.

Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(21, 22)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is very fine, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in

the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” *(26)*. Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” *(22)* and in “Keys to Soil Taxonomy” *(21)*. Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Allegheny Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces in river valleys
Parent material: Alluvium derived from sandstone, siltstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 7 percent

Associated Soils

- Pope soils, which are well drained, have more sand in the subsoil, and are more susceptible to flooding than the Allegheny soils; on floodplains
- Shottower soils, which have more clay in the subsoil and are redder than the Allegheny soils; on high stream terraces
- Frederick soils, which have more clay in the subsoil and are redder than the Allegheny soils; on hillslopes

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Allegheny loam, 0 to 2 percent slopes, rarely flooded; 1.22 miles south-southeast of the intersection of Highways VA-854 and VA-661, about 1.03 miles northeast of the intersection of Highways VA-883 and VA-679, about 100 feet west of a farm road, on a low terrace of the Powell River, 225 feet east of the river, in pasture; Back Valley, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 38 minutes 13 seconds N. and long. 83 degrees 14 minutes 28 seconds W.

Ap—0 to 5 inches; brown (10YR 4/3) loam; weak fine and medium granular structure; very friable; many very fine roots; slightly acid; abrupt smooth boundary.

Bt1—5 to 10 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; firm; common very fine roots; few faint clay films on all faces of peds; slightly acid; clear smooth boundary.

Bt2—10 to 16 inches; yellowish brown (10YR 5/6) clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; few faint clay films on all faces of peds; strongly acid; clear smooth boundary.

Bt3—16 to 30 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few very fine roots; few faint clay films on all faces of peds; strongly acid; clear smooth boundary.

BC—30 to 62 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; friable; strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Reaction: Strongly acid to extremely acid (in unlimed areas)

Rock fragments: 0 to 15 percent in the A and BA horizons, 0 to 30 percent in the Bt horizon, and 0 to 35 percent in the BC horizon and the C horizon, where it occurs

Ap horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—loam

A horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—dominantly 4 or 5; 3 to 5 where horizon is less than 6 inches thick
Chroma—dominantly 2 to 4; 1 to 3 where horizon is less than 6 inches thick
Texture—loam

BA horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—sandy loam to silt loam

Bt horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—3 to 8
Texture (in the fine-earth fraction)—clay loam, sandy clay loam, loam, silt loam, or silty clay loam that has more than 15 percent sand coarser than very fine sand

BC horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—fine sandy loam, loam, sandy clay loam, or clay loam

C horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—fine sandy loam, loam, sandy clay loam, or clay loam

Alticrest Series

Physiographic provinces: Appalachian Plateau and Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from sandstone
Drainage class: Somewhat excessively drained
Slowest saturated hydraulic conductivity: High
Depth class: Moderately deep
Slope range: 15 to 55 percent

Associated Soils

- Gilpin soils, which have less sand and more clay in the subsoil than the Alticrest soils; on similar landforms in areas of shale bedrock
- Wallen soils, which have more rock fragments in the subsoil than the Alticrest soils; on similar landforms

Taxonomic Classification

Coarse-loamy, siliceous, semiactive, mesic Typic Dystrudepts

Typical Pedon

Alticrest fine sandy loam in an area of Alticrest-Gilpin complex, 15 to 35 percent slopes; 0.46 mile southeast of the intersection of Highways VA-628 and VA-720, about 1.0 mile north of the intersection of Highways VA-720 and VA-606, in woodland; Ben Hur, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 47 minutes 59 seconds N. and long. 83 degrees 1 minute 54 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.

A—1 to 3 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate fine granular structure; very friable, nonsticky, nonplastic; common very fine roots; 5 percent sandstone gravel; very strongly acid; abrupt wavy boundary.

BE—3 to 5 inches; dark yellowish brown (10YR 4/4) sandy loam; moderate coarse granular structure; very friable, nonsticky, nonplastic; common very fine roots; 5 percent sandstone gravel; strongly acid; clear wavy boundary.

Bw1—5 to 17 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable, nonsticky, nonplastic; few very fine and coarse roots; few medium vesicular pores; 5 percent sandstone gravel; strongly acid; clear wavy boundary.

Bw2—17 to 27 inches; strong brown (7.5YR 5/6) sandy loam; weak coarse subangular blocky structure; very friable, nonsticky, nonplastic; few very fine and coarse roots; few medium vesicular pores; 10 percent sandstone gravel; strongly acid; clear wavy boundary.

C—27 to 30 inches; strong brown (7.5YR 5/6) loamy sand; massive; very friable, nonsticky, nonplastic; few very fine and coarse roots; few medium vesicular pores; 10 percent sandstone gravel; strongly acid; abrupt smooth boundary.

R—30 inches; sandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Reaction: Very strongly acid or strongly acid
Rock fragments: 0 to 15 percent sandstone gravel throughout the profile

A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 to 4
Texture—fine sandy loam

E horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 8
Texture—sandy loam, loam, or fine sandy loam

BE horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 8
Texture—sandy loam, loam, or fine sandy loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—sandy loam, loam, or fine sandy loam

C horizon:
Hue—7.5YR or 10YR
Value—5 to 7
Chroma—3 to 6
Texture—sandy loam, loamy sand, or sand

Beech Grove Series

Physiographic province: Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from limestone
Drainage class: Excessively drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very shallow
Slope range: 3 to 60 percent

Associated Soils

- Carbo soils, which are moderately deep to limestone bedrock and have more clay in the subsoil than the Beech Grove soils; on similar landforms

Taxonomic Classification

Loamy, mixed, superactive, nonacid, mesic Lithic Udorthents

Typical Pedon

Beech Grove silt loam in an area of Beech Grove-Rock outcrop complex, 3 to 60 percent slopes; 225 feet north of Highway VA-679 at a point 0.9 mile east of the intersection of Highways VA-833 and VA-679, in woodland; Back Valley, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 39 seconds N. and long. 83 degrees 15 minutes 41 seconds W.

A—0 to 3 inches; very dark brown (10YR 2/2) silt loam; weak fine and medium granular structure; very friable; many fine and very fine and common medium roots; 10 percent limestone channers; moderately alkaline; abrupt smooth boundary.
R—3 inches; limestone bedrock.

Range in Characteristics

Solum thickness: 1 to 8 inches
Depth to bedrock: 1 to 8 inches
Rock fragments: 0 to 35 percent
Reaction: Slightly acid to moderately alkaline; some pedons effervesce

A horizon:
Hue—7.5YR or 10YR
Value—2 to 4
Chroma—2 to 4
Texture—silt loam

Berks Series

Physiographic provinces: Appalachian Plateau and Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 15 to 80 percent

Associated Soils

- Gilpin soils, which have fewer rock fragments in the subsoil than the Berks soils; on similar landforms
- Weikert soils, which are shallow to shale bedrock; on similar landforms
- Soils that are very deep to bedrock and have fewer rock fragments in the subsoil than the Berks soils; on footslopes and concave head slopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Berks silt loam in an area of Berks-Weikert complex, 15 to 35 percent slopes; 800 feet north of Highway VA-610 at a point 0.3 mile east of the Tennessee State line, in woodland; Kyles Ford, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 35 minutes 50 seconds N. and long. 83 degrees 5 minutes 51 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.
A—1 to 5 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; very friable; common very fine and fine roots; 10 percent shale channers; strongly acid; abrupt smooth boundary.
Bw1—5 to 10 inches; dark yellowish brown (10YR 4/4) very channery silt loam; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine and fine roots; 45 percent shale channers; strongly acid; clear smooth boundary.
Bw2—10 to 16 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; very friable; few very fine and fine roots; 55 percent shale channers; strongly acid; clear smooth boundary.
C—16 to 29 inches; yellowish brown (10YR 5/6) extremely channery silt loam; massive; very friable; few very fine roots; 70 percent shale channers; strongly acid; abrupt smooth boundary.
R—29 inches; shale bedrock.

Range in Characteristics

Solum thickness: 12 to 40 inches
Depth to bedrock: 20 to 40 inches
Reaction: Extremely acid to slightly acid
Rock fragments: Shale channers; content ranges from 10 to 15 percent in the A horizon, 15 to 75 percent in individual subhorizons of the B horizon, and 35 to 90 percent in the C horizon; the average content of rock fragments in the particle-size control section is more than 35 percent

A horizon:
Hue—10YR
Value—3 to 5

Chroma—2 to 4
Texture—silt loam

Bw horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—loam, silt loam, or silty clay loam

C horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture (in the fine-earth fraction)—loam or silt loam

Bethesda Series

Physiographic province: Appalachian Plateau
Landform: Mountains and hills that have been surface mined for coal
Parent material: Acid mine spoil or earthy fill derived from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 80 percent

Associated Soils

- Fairpoint soils, which are less acid than the Bethesda soils; on similar landforms
- Sewell soils, which have more sand and less silt and clay in the subsoil than the Bethesda soils and have rock fragments that are dominantly coarse-grained sandstone; on similar landforms
- Itmann soils, which have coarse-grained carbolithic fragments from waste material of deep-mined coal; in head-of-hollow fills and in coal mine dumps
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent, undisturbed hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent, undisturbed hillslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents

Typical Pedon

Bethesda gravelly silt loam in an area of Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky; 2.1 miles north-northeast of the intersection of Highways VA-765 and US-421, in a reclaimed area planted to grasses and small shrubs; Pennington Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 47 minutes 53 seconds N. and long. 83 degrees 5 minutes 47 seconds W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) gravelly silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine roots; 5 percent shale channers and 15 percent sandstone gravel; rock fragments are oriented in an irregular pattern; moderately acid; abrupt irregular boundary.
C1—7 to 23 inches; yellowish brown (10YR 5/4) and brown (10YR 4/3) very channery silt loam; massive; friable, slightly sticky, slightly plastic; common very fine roots; 2 percent coal gravel, 3 percent sandstone gravel, and 45 percent shale channers;

rock fragments are oriented in an irregular pattern; strongly acid; gradual irregular boundary.

C2—23 to 62 inches; very dark grayish brown (10YR 3/2) and dark gray (10YR 4/1) extremely channery silty clay loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; few pockets of coarse strong brown (7.5YR 5/6), strongly acid silty clay loam; 2 percent coal gravel, 3 percent mudstone flagstones, 5 percent sandstone gravel, and 55 percent shale channers; rock fragments are oriented in an irregular pattern; very strongly acid.

Range in Characteristics

Solum thickness: 0 to 7 inches
Depth to bedrock: More than 60 inches
Reaction: Strongly acid to extremely acid (in unlimed areas)
Rock fragments: Dominantly shale, siltstone, and mudstone fragments and including small amounts of sandstone and coal fragments that range to as much as 10 inches or more in size; content ranges from 15 to 35 percent in the A horizon and from 15 to 80 percent in the C horizon

A or Ap horizon:
Hue—7.5YR to 5Y or neutral
Value—3 to 6
Chroma—0 to 8
Texture (in the fine-earth fraction)—silt loam

C horizon:
Hue—7.5YR to 5Y or neutral
Value—3 to 6
Chroma—0 to 8
Texture (in the fine-earth fraction)—commonly silty clay loam or silt loam or, less commonly, clay loam or loam

Carbo Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Moderately deep
Slope range: 7 to 60 percent

Associated Soils

- Frederick soils, which are very deep to limestone bedrock; on similar landforms
- Timberville soils, which are very deep to bedrock; in drainageways and in the bottom of sinkholes
- Beech Grove soils, which are very shallow to limestone bedrock; on similar landforms
- Poplimento soils, which are very deep to interbedded shale and limestone bedrock; on similar landforms
- Watahala soils, which are very deep to limestone bedrock and have more chert pebbles in the upper part than the Carbo soils; on similar landforms

Taxonomic Classification

Very fine, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Carbo silt loam in an area of Carbo-Beech Grove complex, 7 to 15 percent slopes, rocky; 0.25 mile southwest of the junction of Highways US-421 and VA-642, about 0.68 mile east-northeast of the junction of Highways VA-642 and VA-638, in pasture; Stickleyville, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 43 minutes 41 seconds N. and long. 82 degrees 59 minutes 48 seconds W.

Ap—0 to 3 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, moderately sticky, moderately plastic; common very fine roots; slightly acid; clear wavy boundary.

BA—3 to 8 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium granular structure; friable, moderately sticky, moderately plastic; few very fine roots; slightly acid; clear wavy boundary.

Bt1—8 to 20 inches; strong brown (7.5YR 5/8) clay; moderate fine subangular blocky structure; friable, moderately sticky, moderately plastic; few very fine roots; many distinct clay films on all faces of peds; few fine black (10YR 2/1) manganese coatings on faces of peds; slightly acid; clear wavy boundary.

Bt2—20 to 28 inches; yellowish red (5YR 4/6) clay; moderate fine subangular blocky structure; friable, moderately sticky, moderately plastic; few very fine roots; very few slickensides (pedogenic) and many distinct clay films on all faces of peds; few fine black (10YR 2/1) manganese coatings on faces of peds; slightly acid; abrupt smooth boundary.

R—28 inches; limestone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches

Depth to bedrock: 20 to 40 inches

Reaction: Very strongly acid to neutral in the A, Ap, and BA horizons and moderately acid to slightly alkaline in the Bt and BC horizons

Rock fragments: Limestone, shale, or quartz fragments; content ranges from 0 to 10 percent in the A horizon and from 0 to 15 percent in the B and C horizons

Ap horizon:

Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam

A horizon (if it occurs):

Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 6
Texture—silt loam

BA horizon:

Hue—7.5YR or 10YR
Value—3 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam

Bt horizon:

Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—clay

BC horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—4 to 8
Texture—clay or silty clay

Chagrin Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Holly soils, which are poorly drained; on lower floodplains
- Orrville soils, which are somewhat poorly drained; on similar landforms
- Lobdell soils, which are moderately well drained; on similar landforms
- Timberville soils, which are well drained; on colluvial footslopes and in colluvial drainageways

Taxonomic Classification

Fine-loamy, mixed, active, mesic Dystric Fluventic Eutrudepts

Typical Pedon

Chagrin loam in an area of Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded; 400 feet south of Highway US-Alternate 58 at a point 2,200 feet east of Highway VA-643, on a floodplain of Cane Creek, in hayland; Ben Hur, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 44 minutes 51 seconds N. and long. 83 degrees 2 minutes 49 seconds W.

Ap—0 to 6 inches; brown (10YR 4/3) loam; moderate medium granular structure; very friable, slightly sticky, slightly plastic; many very fine roots; neutral; abrupt smooth boundary.
Bw1—6 to 18 inches; dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; many faint organic stains on surfaces along root channels; 1 percent rounded sandstone gravel; neutral; abrupt smooth boundary.
Bw2—18 to 42 inches; strong brown (7.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common distinct organic stains on surfaces along root channels; 5 percent rounded sandstone gravel; neutral; clear wavy boundary.
C—42 to 62 inches; brown (7.5YR 4/4) sandy loam; massive; very friable, slightly sticky, slightly plastic; 10 percent rounded sandstone gravel; neutral.

Range in Characteristics

Solum thickness: 24 to 48 inches
Depth to bedrock: More than 60 inches
Reaction: Moderately acid to neutral
Rock fragments: 0 to 15 percent rounded sandstone, subrounded chert, or subrounded shale

Ap horizon:
Hue—10YR
Value—4
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam

A horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, silt loam, clay loam, sandy clay loam, or silty clay loam

C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, silt loam, or sandy loam

Escatawba Series

Physiographic province: Valley and Ridge
Landform: Base of slopes of hills and mountains and areas in valleys
Parent material: Colluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- Jefferson soils, which do not have a seasonal high water table; on similar or higher elevated landforms
- Oriskany soils, which have more rock fragments in the subsoil than the Escatawba soils; on higher landforms
- Gilpin soils, which are moderately deep to shale bedrock; on hillslopes

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Oxyaquic Paleudults

Typical Pedon

Escatawba loam in an area of Escatawba-Jefferson complex, 7 to 15 percent slopes; 1 mile west-northwest of the intersection of Highways VA-724 and VA-860, about 1.37 miles north-northwest of the easternmost intersection of Highways US-58 and VA-684, in woodland; Ewing, Kentucky USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 39 minutes 8 seconds N. and long. 83 degrees 26 minutes 58 seconds W.

Ap—0 to 5 inches; dark brown (10YR 3/3) loam; moderate fine granular structure; very friable, nonsticky, nonplastic; common fine roots; 5 percent sandstone gravel; strongly acid; abrupt smooth boundary.

BE—5 to 17 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky

structure; very friable, nonsticky, nonplastic; common fine roots; 5 percent sandstone gravel; strongly acid; clear wavy boundary.

Bt1—17 to 38 inches; yellowish brown (10YR 5/6) loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common faint clay films on all faces of peds; 5 percent sandstone gravel; very strongly acid; clear wavy boundary.

2Bt2—38 to 47 inches; strong brown (7.5YR 5/6) clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common faint clay films on all faces of peds; common coarse prominent pale brown (10YR 6/3) iron depletions; 2 percent sandstone cobbles and 10 percent sandstone gravel; very strongly acid; gradual wavy boundary.

2Bt3—47 to 62 inches; strong brown (7.5YR 5/6) gravelly clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common faint clay films on all faces of peds; many coarse prominent light brownish gray (10YR 6/2) iron depletions and many coarse distinct yellowish red (5YR 5/8) masses of oxidized iron; 5 percent sandstone cobbles and 15 percent sandstone gravel; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to strongly acid in the A, E, and BE horizons and very strongly acid or strongly acid in the Bt and 2Bt horizons
Rock fragments: Gravel and cobbles; content ranges from 0 to 15 percent in the A, E, and BE horizons, from 0 to 35 percent in the Bt horizon, from 10 to 35 percent in the upper part of the 2Bt horizon, and from 15 to 50 percent in the lower part of the 2Bt horizon

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—loam

A horizon (if it occurs):
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loam

E horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—3 to 6
Texture—fine sandy loam, loam, or silt loam

BE horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—3 to 6
Texture—fine sandy loam, loam, or silt loam

Bt horizon:
Hue—7.5YR to 2.5Y
Value—5 or 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam or silt loam

2Bt horizon:
Hue—2.5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—clay loam or clay

Fairpoint Series

Physiographic province: Appalachian Plateau
Landform: Mountains and hills that have been surface mined for coal
Parent material: Nonacid mine spoil or earthy fill derived from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 80 percent

Associated Soils

- Bethesda soils, which are more acid than the Fairpoint soils; on similar landforms
- Sewell soils, which have more sand and less silt and clay in the subsoil than the Fairpoint soils and have rock fragments that are dominantly coarse-grained sandstone; on similar landforms
- Itmann soils, which contain coarse-grained carbolithic fragments from waste material of deep-mined coal; in head-of-hollow fills and coal mine dumps
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent, undisturbed hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent, undisturbed hillslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents

Typical Pedon

Fairpoint channery silt loam in an area of Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky; 0.72 mile west-northwest of the intersection of Highways VA-765 and VA-754, about 2.1 miles north-northeast of the intersection of Highways VA-765 and US-421, in a reclaimed area planted to grasses and small shrubs; Pennington Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 47 minutes 56 seconds N. and long. 83 degrees 5 minutes 37 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) channery silt loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 1 percent coal gravel, 1 percent sandstone cobbles, 3 percent sandstone gravel, and 15 percent shale channers; rock fragments are oriented in an irregular pattern; slightly alkaline; clear wavy boundary.

C1—5 to 9 inches; yellowish brown (10YR 5/4) very channery loam; massive; friable, slightly sticky, slightly plastic; common very fine and fine roots; 2 percent coal gravel, 3 percent sandstone cobbles, 5 percent sandstone gravel, and 30 percent shale channers; rock fragments are oriented in an irregular pattern; slightly alkaline; abrupt wavy boundary.

C2—9 to 21 inches; very dark gray (10YR 3/1) very channery silt loam; many medium prominent pale olive (5Y 6/4) mottles; massive; friable, slightly sticky, slightly plastic; few very fine roots; 2 percent coal gravel, 3 percent sandstone cobbles, 5 percent sandstone gravel, and 30 percent shale channers; rock fragments are oriented in an irregular pattern; moderately acid; abrupt wavy boundary.

C3—21 to 62 inches; brown (10YR 4/3) very channery silt loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; firm, slightly sticky, slightly plastic; few very fine roots; 2 percent coal gravel, 3 percent sandstone cobbles, 5 percent sandstone gravel, and 35 percent shale channers; rock fragments are oriented in an irregular pattern; neutral.

Range in Characteristics

Solum thickness: 0 to 8 inches
Depth to bedrock: More than 60 inches
Reaction: Typically moderately acid to neutral; the surface layer can be slightly alkaline in limed areas
Rock fragments: Dominantly shale, siltstone, and mudstone fragments and including small amounts of sandstone and coal fragments that range to as much as 10 inches or more in size; content ranges from 15 to 35 percent in the A horizon and from 35 to 80 percent in the C horizon

A or Ap horizon:
Hue—7.5YR to 5Y or neutral
Value—3 to 6
Chroma—0 to 6
Texture (in the fine-earth fraction)—silt loam

C horizon:
Hue—7.5YR to 5Y or neutral
Value—3 to 6
Chroma—0 to 8
Texture (in the fine-earth fraction)—dominantly silty clay loam or silt loam; clay loam or loam in some pedons

Frederick Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 60 percent

Associated Soils

- Carbo soils, which are moderately deep to limestone bedrock; on similar landforms
- Watahala soils, which have more chert gravel in the upper part of the subsoil than the Frederick soils and are deeper to a clayey subsoil; on similar landforms
- Timberville soils, which have a zone of accumulated clay at a depth of more than 20 inches and are darker than the Frederick soils; in depressions or adjacent to drainageways

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Paleudults

Typical Pedon

Frederick silt loam, karst, 7 to 15 percent slopes; 400 feet west of Highway VA-638 at a point 0.4 mile north of the intersection of Highways US-58 and VA-638, in a cultivated field; Stickleyville, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 42 minutes 20 seconds N. and long. 82 degrees 59 minutes 39 seconds W.

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few very fine and fine roots; 10 percent chert gravel; moderately acid; abrupt smooth boundary.
Bt1—9 to 21 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; friable; few very fine roots; few distinct clay films on all faces of peds; 5 percent chert gravel; moderately acid; clear smooth boundary.
Bt2—21 to 43 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; firm; few very fine roots; common distinct clay films on all faces of peds; 10 percent chert gravel; strongly acid; clear wavy boundary.
Bt3—43 to 62 inches; red (2.5YR 4/6) gravelly clay; moderate medium subangular blocky structure; firm; few very fine roots; common distinct clay films on all faces of peds; 15 percent chert gravel; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 72 inches
Reaction: Very strongly acid to moderately acid (in unlimed areas)
Rock fragments: Dominantly chert; content ranges from 0 to 35 percent in the A horizon, from 0 to 60 percent in the E, BA, and BE horizons, and from 0 to 35 percent in the Bt, BC, and C horizons

Ap horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—2 to 8
Texture (in the fine-earth fraction)—silt loam or loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—1 to 4
Texture (in the fine-earth fraction)—silt loam or loam

E horizon (if it occurs):
Hue—7.5YR or 10YR
Value—5 to 7
Chroma—3 to 8
Texture (in the fine-earth fraction)—silt loam or loam

BA or BE horizon (if it occurs):
Hue—2.5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silt loam, silty clay loam, or clay loam

Bt horizon:
Hue—2.5YR or 5YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—clay loam, silty clay loam, silty clay, or clay in the upper part and silty clay or clay in the lower part

BC horizon (if it occurs):
Hue—2.5YR to 10YR
Value—3 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—silty clay or clay

C horizon (if it occurs):
Hue—7.5YR or 5YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silty clay or clay

Gilpin Series

Physiographic provinces: Appalachian Plateau and Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 7 to 70 percent

Associated Soils

- Berks soils, which have more rock fragments in the subsoil than the Gilpin soils; on similar landforms
- Wallen soils, which have more rock fragments and sand in the subsoil than the Gilpin soils; in areas of sandstone bedrock on similar landforms and on shoulders and summits
- Alticrest soils, which have more sand and less clay in the subsoil than the Gilpin soils; in areas of sandstone bedrock on similar landforms and on shoulders and summits

Taxonomic Classification

Fine-loamy, mixed, active, mesic Typic Hapludults

Typical Pedon

Gilpin silt loam in an area of Gilpin-Berks complex, 35 to 55 percent slopes; 0.55 mile south-southwest of the intersection of Highways US-421 and VA-765, about 0.99 mile west-southwest of the intersection of Highways US-421 and VA-741, in woodland; Pennington Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 45 minutes 38 seconds N. and long. 83 degrees 6 minutes 10 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.
A—1 to 2 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; 5 percent shale channers; strongly acid; abrupt smooth boundary.
BE—2 to 5 inches; yellowish brown (10YR 5/4) silt loam; moderate coarse granular structure; very friable, slightly sticky, slightly plastic; common very fine, fine, medium, and coarse roots; 5 percent shale channers; strongly acid; clear wavy boundary.
Bt—5 to 19 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; few fine vesicular pores; common distinct clay films on all faces of peds; 5 percent shale channers; strongly acid; gradual wavy boundary.
BC—19 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; common coarse distinct strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; few fine

vesicular pores; few distinct clay films on all faces of peds; 10 percent shale channers; strongly acid; abrupt wavy boundary.
Cr—29 inches; shale bedrock.

Range in Characteristics

Solum thickness: 18 to 36 inches
Depth to bedrock: 20 to 40 inches
Reaction: Strongly acid to extremely acid
Rock fragments: Mostly shale or siltstone channers and some sandstone channers; content ranges from 5 to 15 percent in the A horizon, from 5 to 40 percent in the BA, BE, Bt, and BC horizons, and from 30 to 90 percent in the C horizon; in the upper 20 inches of the argillic horizon, the content is less than 35 percent

A or Ap horizon:
Hue—10YR
Value—3 to 5 (6 or 7 dry)
Chroma—2 to 4
Texture—silt loam

BA horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 5
Texture (in the fine-earth fraction)—silt loam or loam

BE horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 5
Texture (in the fine-earth fraction)—silt loam or loam

Bt horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silt loam, loam, clay loam, or silty clay loam

BC horizon:
Hue—7.5YR to 2.5Y
Value—3 to 6
Chroma—2 to 8
Texture (in the fine-earth fraction)—silt loam, loam, or silty clay loam

C horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—3 to 5
Chroma—2 to 6
Texture (in the fine-earth fraction)—silt loam, loam, or silty clay loam

Holly Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Poorly drained
Slowest saturated hydraulic conductivity: Moderately high

Depth class: Very deep
Slope range: 0 to 2 percent

Associated Soils

- Orrville soils, which are somewhat poorly drained; on higher floodplains
- Lobdell soils, which are moderately well drained; on higher floodplains
- Chagrin soils, which are well drained; on higher floodplains

Taxonomic Classification

Fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Holly loam, 0 to 2 percent slopes, frequently flooded; 0.27 mile south-southeast of the intersection of Highways VA-659 and VA-656, on a floodplain of Trading Creek, in pasture; Hubbard Springs, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 42 minutes 46 seconds N. and long. 83 degrees 11 minutes 35 seconds W.

Ap—0 to 4 inches; dark gray (10YR 4/1) loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; common fine roots; common fine prominent yellowish red (5YR 4/6) masses of oxidized iron on faces of peds; slightly acid; clear wavy boundary.

Bg1—4 to 10 inches; gray (5Y 5/1) loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; common fine prominent strong brown (7.5YR 5/8) masses of oxidized iron on faces of peds; slightly acid; clear wavy boundary.

Bg2—10 to 34 inches; dark gray (5Y 4/1) loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine prominent strong brown (7.5YR 5/8) masses of oxidized iron on faces of peds; 2 percent rounded sandstone gravel; slightly acid; clear wavy boundary.

Cg—34 to 62 inches; dark gray (N 4/0) loam; massive; friable, slightly sticky, slightly plastic; 5 percent rounded sandstone gravel; slightly acid.

Range in Characteristics

Solum thickness: 20 to 44 inches
Depth to bedrock: More than 60 inches
Reaction: Moderately acid to neutral in the A horizon, strongly acid to neutral in the B horizon, and moderately acid to slightly alkaline in the C horizon
Rock fragments: 0 to 10 percent in the A horizon, 0 to 15 percent in the B horizon, and 0 to 25 percent in the C horizon

A or Ap horizon:
Hue—10YR
Value—4
Chroma—1 or 2
Texture—loam

Bg horizon:
Hue—10YR to 5Y or neutral
Value—4 to 6
Chroma—2 or less
Texture—dominantly silt loam, loam, or silty clay loam; thin subhorizons of sandy loam occur in some pedons

Cg horizon:
Hue—10YR to 5Y or neutral
Value—4 to 6

Chroma—2 or less
Texture—silt loam, loam, sandy loam, or clay loam; below a depth of 40 inches, the profile is typically stratified and includes textures of loamy sand and sand; thin layers of silty clay loam may occur

Itmann Series

Physiographic province: Appalachian Plateau
Landform: Areas used as dumps for waste material from deep-mined coal
Parent material: Acid waste materials from deep-mined coal, which contain coal and black or dark-colored shale and siltstone
Drainage class: Somewhat excessively drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 0 to 80 percent

Associated Soils

- Fairpoint soils, which are less acid than the Itmann soils, are lighter in color, have more fine-grained material, and have rock fragments that are dominantly light-colored shale; on reclaimed strip-mined benches, on outslopes, and in areas restored to about the original contour
- Bethesda soils, which are lighter in color than the Itmann soils, have more fine-grained material, and have rock fragments that are dominantly light-colored shale; on reclaimed strip-mined benches, on outslopes, and in areas restored to about the original contour
- Sewell soils, which are lighter in color than the Itmann soils and have rock fragments that are dominantly brown sandstone; on reclaimed strip-mined benches, on outslopes, and in areas restored to about the original contour
- Gilpin and Alticrest soils, which are moderately deep to bedrock; on adjacent, undisturbed hillslopes
- Pineville soils, which formed in undisturbed colluvium; in drainageways and on footslopes

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, acid, mesic Typic Udorthents

Typical Pedon

Itmann extremely channery sandy loam, 0 to 80 percent slopes; 1.52 miles west-northwest of the westernmost intersection of Highways VA-624 and VA-606, in mine dumps from deep coal mines; Keokee, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 51 minutes 44 seconds N. and long. 82 degrees 56 minutes 19 seconds W.

C1—0 to 37 inches; very dark grayish brown (10YR 3/2) and black (10YR 2/1) extremely channery sandy loam; few prominent white (N 8/0) and common coarse prominent olive-yellow (2.5Y 6/6) mottles; olive-yellow mottles are soft masses from the oxidation of sulfur and iron minerals; white mottles are flaky and crusty precipitates on surface of rock fragments and occur in upper 6 inches of horizon only; massive; loose, nonsticky, nonplastic; 10 percent sandstone gravel and 70 percent shale channers; very strongly acid; diffuse broken boundary.
C2—37 to 62 inches; very dark grayish brown (10YR 3/2) and black (10YR 2/1) extremely channery sandy loam; massive; loose, nonsticky, nonplastic; 10 percent sandstone gravel and 70 percent shale channers; very strongly acid.

Range in Characteristics

Depth to bedrock: More than 60 inches
Reaction: Extremely acid to strongly acid (except in limed areas)
Rock fragments: Dominantly carbolithic fragments and dark, shaly material but including some light-colored sandstone and shale; content ranges from 60 to 80 percent in the A horizon and from 35 to 80 percent in the AC and C horizons

A horizon (where it occurs in reclaimed areas where soil material has been stockpiled on refuse piles):
Hue—10YR or 2.5Y
Value—2 to 6
Chroma—2 to 6
Texture (in the fine-earth fraction)—loam or sandy loam

AC horizon (if it occurs):
Hue—10YR or neutral
Value—2 or 3
Chroma—1 or 2
Texture (in the fine-earth fraction)—sandy loam or loam that has pockets of loamy sand

C horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—1 or 2
Texture (in the fine-earth fraction)—sandy loam or loam that has pockets of loamy sand

Jefferson Series

Physiographic province: Valley and Ridge
Landform: Base of slopes of hills and mountains and areas in valleys
Parent material: Colluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 2 to 35 percent

Associated Soils

- Escatawba soils, which have a seasonal high water table at a depth of 30 to 48 inches; on similar or lower landforms
- Oriskany soils, which have more rock fragments in the subsoil and on the soil surface than the Jefferson soils; on similar or higher landforms
- Gilpin soils, which are moderately deep to shale bedrock; on hillslopes

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Hapludults

Typical Pedon

Jefferson loam in an area of Escatawba-Jefferson complex, 7 to 15 percent slopes; 0.19 mile north of the intersection of Highways VA-845 and VA-621, about 1.83 miles east-northeast of the intersection of Highways VA-621 and VA-726, in pasture; Keokee, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 47 minutes 54 seconds N. and long. 82 degrees 55 minutes 20 seconds W.

Ap—0 to 4 inches; brown (10YR 4/3) loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; common very fine roots; 2 percent well rounded conglomerate gravel and 3 percent subangular sandstone gravel; moderately acid; abrupt smooth boundary.

BA—4 to 11 inches; dark yellowish brown (10YR 4/4) loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; common very fine roots; few very fine vesicular pores; 2 percent well rounded conglomerate gravel and 3 percent subangular sandstone gravel; moderately acid; abrupt smooth boundary.

Bt1—11 to 23 inches; strong brown (7.5YR 4/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; common very fine vesicular pores; common faint clay films on all faces of peds; 2 percent well rounded conglomerate gravel and 3 percent subangular sandstone gravel; strongly acid; gradual wavy boundary.

Bt2—23 to 42 inches; yellowish brown (10YR 5/8) clay loam; moderate coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common very fine vesicular pores; common faint clay films on all faces of peds; 2 percent well rounded conglomerate gravel and 3 percent subangular sandstone gravel; strongly acid; gradual wavy boundary.

BC—42 to 62 inches; yellowish brown (10YR 5/6) gravelly clay loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine vesicular pores; few faint clay films on all faces of peds; few fine distinct light yellowish brown (10YR 6/4) iron depletions; 5 percent well rounded conglomerate gravel and 15 percent subangular sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: More than 40 inches
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid to slightly acid in the A and BA horizons and strongly acid or very strongly acid in the Bt and C horizons
Rock fragments: 5 to 15 percent in the A horizon, 5 to 35 percent to a depth of about 40 inches, and 20 to 80 percent below a depth of 40 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam

A horizon (if it occurs):
Hue—10YR
Value—3 to 5
Chroma—1 to 3
Texture (in the fine-earth fraction)—loam, sandy loam, fine sandy loam, or silt loam

BA horizon:
Hue—10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silt loam, loam, or sandy loam

BE horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silt loam, loam, or sandy loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam, sandy loam, sandy clay loam, or clay loam

BC horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—sandy loam, fine sandy loam, sandy clay loam, or clay loam

C horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—sandy loam, fine sandy loam, sandy clay loam, or clay loam

2C horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 8
Texture—silt loam or silty clay loam

Lobdell Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Holly soils, which are poorly drained; on the lower floodplains
- Orrville soils, which are somewhat poorly drained; on similar landforms
- Chagrin soils, which are well drained; on similar landforms
- Timberville soils, which are well drained; on colluvial footslopes and in colluvial drainageways

Taxonomic Classification

Fine-loamy, mixed, active, mesic Fluvaquentic Eutrudepts

Typical Pedon

Lobdell silt loam in an area of Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded; 400 feet west-southwest of the intersection of Highways VA-682 and VA-672, on a floodplain of Hamblin Branch, 50 feet north of the creek, in hayland; Rose Hill, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 38 minutes 12 seconds N. and long. 83 degrees 22 minutes 4 seconds W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine granular structure;

friable, slightly sticky, slightly plastic; common very fine and fine roots; slightly acid; abrupt smooth boundary.

Bw1—8 to 20 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few fine faint pale brown (10YR 6/3) iron depletions and few fine distinct yellowish brown (10YR 5/6) masses of oxidized iron on faces of peds; slightly acid; clear wavy boundary.

Bw2—20 to 35 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common medium distinct light gray (10YR 7/2) iron depletions and common medium prominent yellowish brown (10YR 5/8) masses of oxidized iron on faces of peds; slightly acid; gradual wavy boundary.

Bw3—35 to 48 inches; brown (10YR 5/3) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common medium prominent yellowish brown (10YR 5/8) masses of oxidized iron on faces of peds and many medium faint light gray (10YR 7/2) iron depletions; slightly acid; gradual wavy boundary.

C—48 to 62 inches; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) loam; massive; friable, slightly sticky, slightly plastic; common medium prominent very dark brown (10YR 2/2) manganese masses on faces of peds; slightly acid.

Range in Characteristics

Solum thickness: 24 to 50 inches

Depth to bedrock: More than 60 inches

Reaction: Strongly acid to neutral in the A and B horizons and moderately acid to neutral in the C horizon

Rock fragments: Rounded sandstone, subrounded chert, or subrounded shale; content ranges from 0 to 5 percent in the A horizon and from 0 to 15 percent in the B and C horizons

Ap horizon:

Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam

Bw horizon:

Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—silt loam or loam

C horizon:

Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam or loam

Oriskany Series

Physiographic province: Valley and Ridge

Landform: Base of slopes of hills and mountains and areas in valleys and on hills and mountains

Parent material: Colluvium derived from sandstone and shale

Drainage class: Well drained

Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 7 to 55 percent

Associated Soils

- Jefferson soils, which have fewer rock fragments in the subsoil and on the soil surface than the Oriskany soils; on adjacent landforms
- Escatawba soils, which have fewer rock fragments in the soil profile and on the soil surface than the Oriskany soils and have a seasonal high water table between depths of 2.5 and 4.0 feet; on adjacent landforms
- Wallen and Alticrest soils, which are moderately deep to sandstone bedrock; on mountain slopes at the higher elevations

Taxonomic Classification

Loamy-skeletal, siliceous, semiactive, mesic Typic Hapludults

Typical Pedon

Oriskany cobbly loam, 35 to 55 percent slopes, extremely stony; 1.71 miles west of the intersection of Highways VA-621 and VA-622, about 2.3 miles northeast of the intersection of Highways VA-621 and VA-845, in woodland; Keokee, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 6 seconds N. and long. 82 degrees 53 minutes 12 seconds W.

A—0 to 2 inches; dark yellowish brown (10YR 4/4) cobbly loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; common very fine and fine roots; 5 percent sandstone gravel and 15 percent sandstone cobbles; strongly acid; abrupt wavy boundary.

BE—2 to 12 inches; strong brown (7.5YR 4/6) very cobbly loam; weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; common very fine and fine roots; 5 percent sandstone gravel and 35 percent sandstone cobbles; strongly acid; clear wavy boundary.

Bt1—12 to 35 inches; strong brown (7.5YR 5/6) very cobbly clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few distinct clay films on all faces of peds; 5 percent sandstone gravel and 40 percent sandstone cobbles; strongly acid; gradual wavy boundary.

Bt2—35 to 62 inches; strong brown (7.5YR 5/6), yellowish red (5YR 4/6), and very pale brown (10YR 7/3) very cobbly loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few distinct clay films on all faces of peds; 5 percent sandstone gravel and 45 percent sandstone cobbles; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid or strongly acid
Rock fragments: Sandstone and quartzite sandstone; content ranges from 15 to 35 percent in the A horizon, from 15 to 65 percent in the BE horizon, and from 35 to 75 percent in the Bt and C horizons

A horizon:
Hue—7.5YR or 10YR
Value—2 to 4
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam

BE horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—sandy loam or loam

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam, sandy clay loam, or clay loam

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—sandy loam, loam, or sandy clay loam

Orrville Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Somewhat poorly drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Holly soils, which are poorly drained; on lower floodplains
- Lobdell soils, which are moderately well drained; on similar landforms
- Chagrin soils, which are well drained; on similar landforms
- Timberville soils, which are well drained; on colluvial footslopes and in colluvial drainageways

Taxonomic Classification

Fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Orrville loam in an area of Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded; 0.27 mile south of the intersection of Highways US-58 and VA-660, on a floodplain of Hardy Creek, 75 feet east of the creek, in hayland; Rose Hill, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 40 mintues 59 seconds N. and long. 83 degrees 16 minutes 6 seconds W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; 1 percent rounded sandstone gravel; moderately acid; clear wavy boundary.
Bw—6 to 13 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; few medium prominent strong brown (7.5YR 5/8) masses of oxidized iron on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions; 1 percent rounded sandstone gravel; moderately acid; gradual wavy boundary.
Bg1—13 to 28 inches; grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common

medium prominent strong brown (7.5YR 5/8) masses of oxidized iron on faces of peds; 1 percent rounded sandstone gravel; slightly acid; gradual wavy boundary.

Bg2—28 to 34 inches; grayish brown (10YR 5/2) loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron on faces of peds; 1 percent rounded sandstone gravel; slightly acid; clear wavy boundary.

Cg1—34 to 47 inches; gray (N 5/0) loam; massive; friable, slightly sticky, slightly plastic; few coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron on faces of peds; 1 percent rounded sandstone gravel; moderately acid; abrupt wavy boundary.

Cg2—47 to 62 inches; dark gray (5Y 4/1) sandy loam; massive; very friable, nonsticky, nonplastic; 10 percent rounded sandstone gravel; slightly acid.

Range in Characteristics

Solum thickness: 24 to 50 inches
Depth to bedrock: More than 60 inches
Reaction: Strongly acid to slightly acid in the A and B horizons and strongly acid to neutral in the C horizon
Rock fragments: Rounded sandstone, subrounded chert, or subrounded shale; content ranges from 0 to 5 percent in the A horizon, from 0 to 15 percent in the B horizon, and from 0 to 25 percent in the C horizon

Ap horizon:
Hue—10YR
Value—4
Chroma—2
Texture—loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or loam

Bg horizon:
Hue—10YR to 5Y or neutral
Value—4 to 6
Chroma—2 or less
Texture—silt loam or loam

Cg horizon:
Hue—10YR to 5Y or neutral
Value—4 to 7
Chroma—2 or less
Texture (in the fine-earth fraction)—silt loam, loam, silty clay loam, or sandy loam

Philo Series

Physiographic province: Appalachian Plateau
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from sandstone and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Pope soils, which are well drained; on higher floodplains
- Gilpin and Alticrest soils, which are moderately deep to bedrock; on adjacent hillslopes
- Bethesda, Fairpoint, and Sewell soils, which are well drained; on reclaimed surface mines

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts

Typical Pedon

Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded; 100 feet south of Highway VA-606 at a point 0.9 mile west of Highway VA-624, in a brushy field; Keokee, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 51 minutes 8 seconds N. and long. 82 degrees 54 minutes 50 seconds W.

Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; few very fine, fine, and medium roots; strongly acid; abrupt smooth boundary.

Bw1—8 to 16 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; strongly acid; clear smooth boundary.

Bw2—16 to 30 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few very fine roots; common coarse prominent grayish brown (10YR 5/2) iron depletions; 5 percent sandstone gravel; moderately acid; clear smooth boundary.

C—30 to 62 inches; light olive brown (2.5Y 5/4) sandy loam; massive; friable; few very fine roots; many medium prominent yellowish brown (10YR 5/8) masses of oxidized iron and many medium distinct dark grayish brown (10YR 4/2) iron depletions; moderately acid.

Range in Characteristics

Solum thickness: 20 to 48 inches
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid to moderately acid (except in limed areas)
Rock fragments: 0 to 15 percent in the A, Bw, and C horizons and 0 to 40 percent in the 2C horizon

Ap or A horizon:
Hue—10YR or 7.5YR
Value—3 or 4 (5 or more dry)
Chroma—2 or 3
Texture—fine sandy loam

Bw horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture (in the fine-earth fraction)—fine sandy loam, loam, or sandy loam

C horizon:
Hue—7.5YR to 2.5Y or neutral
Value—4 to 6
Chroma—0 to 4
Texture (in the fine-earth fraction)—fine sandy loam, loam, or sandy loam

2C horizon (if it occurs):
Hue—7.5YR to 2.5Y or neutral
Value—4 to 6
Chroma—0 to 4
Texture—ranging from sand to loam

Pineville Series

Physiographic province: Appalachian Plateau
Landform: Base of slopes of hills and areas on hills and in valleys
Parent material: Colluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 15 to 55 percent

Associated Soils

- Berks and Gilpin soils, which are moderately deep to shale bedrock; on adjacent hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent hillslopes

Taxonomic Classification

Fine-loamy, mixed, active, mesic Typic Hapludults

Typical Pedon

Pineville channery loam, 35 to 55 percent slopes, very stony; 1.69 miles north of the intersection of Highways VA-720 and VA-606, about 0.49 mile northeast of the intersection of Highways VA-628 and VA-720, in woodland; Pennington Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 34 seconds N. and long. 83 degrees 1 minute 58 seconds W.

A—0 to 3 inches; brown (10YR 4/3) channery loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 2 percent sandstone gravel and 15 percent shale channers; moderately acid; clear wavy boundary.

BA—3 to 9 inches; dark yellowish brown (10YR 4/4) channery loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; few fine vesicular pores; 5 percent sandstone gravel and 15 percent shale channers; moderately acid; clear wavy boundary.

Bt1—9 to 35 inches; brown (7.5YR 4/4) channery clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; few fine vesicular pores; common distinct clay films on all faces of peds; 5 percent sandstone gravel and 15 percent shale channers; strongly acid; clear wavy boundary.

Bt2—35 to 52 inches; yellowish brown (10YR 5/6) channery clay loam; moderate fine and medium subangular blocky structure; firm, slightly sticky, slightly plastic; common fine, medium, and coarse roots; few fine vesicular pores; common distinct clay films on all faces of peds; 5 percent sandstone gravel and 15 percent shale channers; strongly acid; gradual wavy boundary.

BC—52 to 62 inches; brownish yellow (10YR 6/6) channery loam; weak coarse subangular blocky structure; friable, moderately sticky, slightly plastic; common fine, medium, and coarse roots; few fine vesicular pores; few distinct clay films on

all faces of peds; 5 percent sandstone gravel and 20 percent shale channers; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to neutral in the A and BA horizons and extremely acid to strongly acid in the Bt and C horizons
Rock fragments: 15 to 35 percent in the A horizon, 10 to 60 percent in the BA, Bt, BC, and C horizons, and, on average, 15 to 35 percent in the control section

A horizon:
Hue—7.5YR or 10YR
Value—2 to 4
Chroma—1 to 3
Texture (in the fine-earth fraction)—loam

BA, Bt, and BC horizons:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam, sandy loam, or clay loam

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam, sandy loam, or clay loam

Pope Series

Physiographic province: Appalachian Plateau
Landform: Floodplains along small creeks in valleys
Parent material: Alluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Philo soils, which are moderately well drained; on lower floodplains
- Alticrest and Gilpin soils, which are moderately deep to bedrock; on adjacent hillslopes
- Bethesda, Fairpoint, and Sewell soils, which are well drained; on reclaimed surface mines

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts

Typical Pedon

Pope fine sandy loam, 0 to 3 percent slopes, occasionally flooded; 375 feet east of Highway VA-625 at a point 3,200 feet south of the intersection of Highways VA-862 and VA-626, in hayland; Big Stone Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 43 seconds N. and long. 82 degrees 56 minutes 21 seconds W.

Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; abrupt smooth boundary.

Bw1—8 to 15 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; very friable; many fine and few medium roots; strongly acid; abrupt smooth boundary.

Bw2—15 to 40 inches; dark yellowish brown (10YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; strongly acid; clear smooth boundary.

Bw3—40 to 51 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; many fine and few medium roots; few medium distinct light yellowish brown (10YR 6/4) masses of oxidized iron; strongly acid; abrupt smooth boundary.

C—51 to 62 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; friable; few medium distinct dark yellowish brown (10YR 4/4) iron-manganese masses; few fine distinct strong brown (7.5YR 5/8) masses of oxidized iron; common medium distinct pale brown (10YR 6/3) iron depletions; strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Reaction: Strongly acid to extremely acid (except in limed areas)
Rock fragments: 0 to 15 percent in the A or Ap horizon, 0 to 30 percent to a depth of about 40 inches, and 0 to 75 percent below a depth of 40 inches

Ap horizon:
Hue—10YR
Value—3 to 5 (6 or more dry)
Chroma—3 to 6
Texture—fine sandy loam

A horizon (if it occurs):
Hue—10YR
Value—3 to 5 (6 or more dry)
Chroma—3 to 6
Texture—fine sandy loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture (in the fine-earth fraction)—fine sandy loam, sandy loam, or loam

C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture (in the fine-earth fraction)—typically fine sandy loam, sandy loam, loam, or silt loam; loamy sandy or sandy in some pedons below a depth of 40 inches

Poplimento Series

Physiographic province: Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from limestone and shale

Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 15 to 65 percent

Associated Soils

- Frederick soils, which have a redder and more clayey subsoil; on similar landforms where limestone bedrock is predominant
- Berks soils, which are moderately deep to shale bedrock; on similar landforms
- Carbo soils, which are moderately deep to limestone bedrock; on similar landforms

Taxonomic Classification

Fine, mixed, subactive, mesic Ultic Hapludalfs

Typical Pedon

Poplimento silt loam in an area of Poplimento-Berks complex, 15 to 35 percent slopes; 0.76 mile north-northwest of the eastern junction of Highways US-58 and VA-684, about 2.2 miles east-northeast of the western junction of Highways US-58 and VA-684, in pasture; Ewing, Kentucky USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 38 minutes 35 seconds N. and long. 83 degrees 27 minutes 0 seconds W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; strong coarse granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; strongly acid; clear wavy boundary.

BA—8 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; many distinct clay films on all faces of peds; strongly acid; abrupt wavy boundary.

Bt1—15 to 30 inches; yellowish brown (10YR 5/8) clay; moderate fine and medium subangular blocky structure; firm, moderately sticky, moderately plastic; few very fine roots; common prominent clay films on all faces of peds; 1 percent shale channers; strongly acid; gradual wavy boundary.

Bt2—30 to 55 inches; yellowish brown (10YR 5/8) clay; common medium faint brownish yellow (10YR 6/8) mottles; moderate coarse subangular blocky structure; firm, moderately sticky, moderately plastic; few very fine roots; common prominent clay films on all faces of peds; common coarse prominent black (10YR 2/1) manganese masses; 1 percent shale channers; strongly acid; gradual wavy boundary.

BC—55 to 62 inches; yellowish brown (10YR 5/4) silty clay; common medium distinct light gray (10YR 7/2) mottles; weak fine subangular blocky structure; firm, moderately sticky, moderately plastic; few very fine roots; few distinct clay films on all faces of peds; common coarse prominent black (10YR 2/1) manganese masses; 1 percent shale channers; slightly acid.

Range in Characteristics

Solum thickness: 40 to 70 inches
Depth to bedrock: More than 60 inches; varies greatly over short distances
Reaction: Very strongly acid to slightly acid
Rock fragments: Channers; content ranges from 0 to 15 percent in the A and BA horizons, from 0 to 15 percent in the upper part of the Bt horizon, and from 0 to 55 percent in the lower part of the Bt horizon and in the C horizon

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 to 6

Chroma—2 to 6
Texture—silt loam

BA horizon:
Hue—5YR to 10YR
Value—3 to 6
Chroma—2 to 8
Texture—loam, silt loam, silty clay loam, silty clay, or clay

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silty clay loam, silty clay, or clay

BC horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silty clay loam, silty clay, or clay

C horizon (if it occurs):
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silty clay loam, silty clay, or clay

Sewell Series

Physiographic province: Appalachian Plateau
Landform: Mountains and hills that have been surface mined for coal
Parent material: Acid mine spoil or earthy fill derived from sandstone
Drainage class: Somewhat excessively drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 0 to 80 percent

Associated Soils

- Fairpoint soils, which are less acid than the Sewell soils, have less sand and more silt and clay in the subsoil, and have rock fragments that are dominantly shale; on similar landforms
- Bethesda soils, which have less sand and more silt and clay in the subsoil than the Sewell soils and have rock fragments that are dominantly shale; on similar landforms
- Itmann soils, which contain coarse-grained, carbolithic fragments from waste material from deep-mined coal; in head-of-hollow fills and coal mine dumps
- Gilpin soils, which are moderately deep to shale bedrock; on adjacent undisturbed hillslopes
- Alticrest soils, which are moderately deep to sandstone bedrock; on adjacent undisturbed hillslopes

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, acid, mesic Typic Udorthents

Typical Pedon

Sewell stony sandy loam in an area of Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky; 0.65 mile northwest of the westernmost intersection of

Highways VA-624 and VA-606, in a reclaimed area planted to grasses and small shrubs; Keokee, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 51 minutes 38 seconds N. and long. 82 degrees 55 minutes 17 seconds W.

A—0 to 10 inches; yellowish brown (10YR 5/4) stony sandy loam; few coarse distinct brownish yellow (10YR 6/6) mottles; moderate coarse granular structure; firm, slightly sticky, slightly plastic; common fine roots; 1 percent coal gravel, 1 percent sandstone gravel, 8 percent sandstone cobbles, and 20 percent sandstone stones; strongly acid; clear wavy boundary.

C1—10 to 47 inches; yellowish brown (10YR 5/4) very stony sandy loam; few coarse distinct brownish yellow (10YR 6/6) mottles; massive; firm, nonsticky, nonplastic; 2 percent coal gravel, 3 percent sandstone gravel, 10 percent sandstone cobbles, and 30 percent sandstone stones; strongly acid; diffuse irregular boundary.

C2—47 to 62 inches; yellowish brown (10YR 5/4) very stony sandy loam; few coarse distinct brownish yellow (10YR 6/6) mottles; massive; firm, nonsticky, nonplastic; 2 percent coal gravel, 3 percent sandstone gravel, 10 percent sandstone cobbles, and 40 percent sandstone stones; strongly acid.

Range in Characteristics

Solum thickness: 2 to 10 inches
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to strongly acid (except where the surface layer has been limed)
Rock fragments: Dominantly sandstone and small quantities of siltstone, shale, and coal; content ranges from 15 to 35 percent in the A horizon and from 35 to 80 percent in the C horizon

A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 6
Texture (in the fine-earth fraction)—sandy loam

C horizon:
Hue—7.5YR or 10YR
Value—2 to 6
Chroma—1 to 8
Texture (in the fine-earth fraction)—sandy loam or loam that has common pockets of loamy sand

Shottower Series

Physiographic province: Valley and Ridge
Landform: High stream terraces in river valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 25 percent

Associated Soils

- Allegheny soils, which have less clay in the subsoil and are browner than the Shottower soils; on low stream terraces
- Frederick and Watahala soils, which formed in clayey residuum; on adjacent hillslopes

- Carbo soils, which formed in clayey residuum and are moderately deep to limestone bedrock; on adjacent hillslopes

Taxonomic Classification

Fine, kaolinitic, mesic Typic Paleudults

Typical Pedon

Shottower silt loam, 2 to 7 percent slopes; 0.3 mile southwest of the intersection of Highways VA-642 and VA-638, about 0.27 mile east-southeast of the intersection of Highways VA-642 and VA-772, in a cultivated field; Ben Hur, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 43 minutes 12 seconds N. and long. 83 degrees 0 minutes 41 seconds W.

Ap—0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; moderate coarse granular structure; friable, very sticky, moderately plastic; common very fine roots; common very fine vesicular pores; moderately acid; abrupt wavy boundary.

Bt1—10 to 18 inches; brown (7.5YR 4/4) silty clay loam; weak coarse subangular blocky structure; firm, very sticky, moderately plastic; common very fine roots; common very fine vesicular pores; few faint clay films on all faces of peds; moderately acid; gradual wavy boundary.

Bt2—18 to 37 inches; yellowish red (5YR 4/6) clay; moderate medium and coarse subangular blocky structure; firm, very sticky, moderately plastic; few very fine roots; few very fine vesicular pores; many prominent clay films on all faces of peds; common fine prominent black (10YR 2/1) manganese coatings on faces of peds; moderately acid; gradual wavy boundary.

Bt3—37 to 62 inches; red (2.5YR 4/6) clay; strong fine, medium, and coarse subangular blocky structure; firm, moderately sticky, moderately plastic; few very fine roots; few very fine vesicular pores; many prominent clay films on all faces of peds; few fine prominent black (10YR 2/1) manganese coatings on faces of peds; moderately acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to moderately acid
Rock fragments: 0 to 15 percent in the A horizon, 0 to 35 percent in the BA and Bt horizons, and 0 to 60 percent below a depth of 40 inches

Ap horizon:
Hue—2.5YR to 10YR
Value—3 to 5
Chroma—3 or 4
Texture—silt loam

A horizon (if it occurs):
Hue—5YR to 10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture (in the fine-earth fraction)—clay, silty clay, silty clay loam, clay loam, or sandy clay loam

Timberville Series

Physiographic province: Valley and Ridge
Landform: Base of slopes of hills and areas in valleys
Parent material: Colluvium derived from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- Carbo soils, which are moderately deep to limestone bedrock; on adjacent hillslopes
- Frederick soils, which have an increase in clay within a depth of 20 inches and are redder than the Timberville soils; on adjacent hillslopes
- Watahala soils, which have more chert gravel in the upper part than the Timberville soils; on adjacent hillslopes

Taxonomic Classification

Fine, mixed, active, mesic Typic Hapludults

Typical Pedon

Timberville silt loam, 2 to 7 percent slopes, frequently flooded; 1,000 feet west of Highway VA-622 at a point 800 feet north of the intersection of Highway US-58 Alternate and Highway VA-622, in hayland; Big Stone Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 13 seconds N. and long. 82 degrees 51 minutes 7 seconds W.

Ap—0 to 3 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; few fine and many very fine roots; moderately acid; abrupt smooth boundary.
AB—3 to 9 inches; brown (10YR 4/3) silt loam; strong coarse subangular blocky structure; friable; common very fine roots; common fine faint dark yellowish brown (10YR 4/4) iron-manganese masses; moderately acid; abrupt smooth boundary.
Bw—9 to 28 inches; dark yellowish brown (10YR 4/4) silt loam; strong coarse subangular blocky structure; friable; few very fine roots; moderately acid; clear smooth boundary.
2Bt1—28 to 37 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; few faint clay films on all faces of peds; slightly acid; clear smooth boundary.
2Bt2—37 to 48 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; many faint clay films on all faces of peds; slightly acid; gradual smooth boundary.
2Bt3—48 to 65 inches; strong brown (7.5YR 4/6) clay loam; moderate medium subangular blocky structure; firm; few faint clay films on all faces of peds; slightly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to slightly acid (except in limed areas)
Rock fragments: 0 to 15 percent in the surface layer, 0 to 60 percent in individual subhorizons of the B horizon, and 0 to 60 percent in the C horizon

Ap horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 5
Texture—silt loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

AB horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 4
Texture (in the fine-earth fraction)—silt loam, loam, or fine sandy loam

E horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—1 to 5
Texture (in the fine-earth fraction)—silt loam, loam, or fine sandy loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—loam, silt loam, silty clay loam, or clay loam

Ab horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—2 to 4
Texture (in the fine-earth fraction)—silt loam, loam, or silty clay loam

Bwb horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—4 to 8
Texture (in the fine-earth fraction)—silt loam, loam, silty clay loam, clay loam, or sandy clay loam

2Bt horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture in the fine-earth fraction)—clay, clay loam, silty clay loam, or silty clay

2Btb horizon (if it occurs):
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture (in the fine-earth fraction)—clay, clay loam, silty clay loam, silt loam, or silty clay

Tumbling Series

Physiographic province: Valley and Ridge
Landform: Base of slopes of hills and mountains and areas on hills and mountains and in valleys
Parent material: Colluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 7 to 35 percent

Associated Soils

- Carbo soils, which are moderately deep to limestone bedrock; on upland landforms in the limestone valley
- Jefferson soils, which have less clay in the subsoil than the Tumbling soils; on similar landforms
- Wallen soils, which are moderately deep to sandstone bedrock; on upland landforms in mountainous areas

Taxonomic Classification

Fine, kaolinitic, mesic Typic Paleudults

Typical Pedon

Tumbling loam, 15 to 25 percent slopes; 300 feet south of Highway VA-679 at a point 0.4 mile east of Highway VA-854, in pasture; Sneedville, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 31 seconds N. and long. 83 degrees 14 minutes 30 seconds W.

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) loam; moderate medium granular structure; very friable; common very fine roots; 10 percent sandstone gravel; strongly acid; abrupt smooth boundary.

BA—4 to 8 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; very friable; common very fine roots; 10 percent sandstone gravel; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; yellowish red (5YR 5/6) gravelly clay loam; weak medium subangular blocky structure; friable; few very fine roots; common faint clay films on all faces of peds; 20 percent sandstone gravel; strongly acid; clear smooth boundary.

Bt2—14 to 20 inches; red (2.5YR 4/6) gravelly clay; moderate medium subangular blocky structure; friable, moderately sticky, moderately plastic; few very fine roots; many distinct clay films on all faces of peds; 15 percent sandstone gravel; strongly acid; clear smooth boundary.

Bt3—20 to 61 inches; red (2.5YR 4/6) gravelly clay; few medium prominent brown (7.5YR 5/4) and common medium prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, moderately sticky, moderately plastic; few very fine roots; many distinct clay films on all faces of peds; 20 percent sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid or strongly acid
Rock fragments: 0 to 15 percent in the A horizon and 0 to 35 percent in the Bt horizon

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam

BA horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—4 to 6
Texture (in the fine-earth fraction)—loam, silt loam, or clay loam

Bt horizon:
Hue—2.5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture (in the fine-earth fraction)—clay loam, sandy clay loam, clay, or silty clay loam

Udorthents

Physiographic province: Valley and Ridge
Landform: Cut and fill areas on hills and in valleys
Parent material: Disturbed soils resulting from cut and fill operations
Drainage class: Variable
Slowest saturated hydraulic conductivity: Variable
Depth class: Variable
Slope range: 0 to 45 percent

Associated Soils

- Frederick soils, which are very deep to limestone bedrock; on undisturbed hillslopes
- Carbo soils, which are moderately deep to limestone bedrock; on undisturbed hillslopes
- Timberville soils, which are subject to frequent flooding of very brief duration; in undisturbed, intermittent drainageways

Typical Pedon

The properties and characteristics of Udorthents vary to the extent that a typical profile cannot be given. Udorthents formed when soils were disturbed by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments and are subject to differential settling. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from slightly compacted to severely compacted. Nonvegetated areas are susceptible to severe erosion. Drainage is variable.

Wallen Series

Physiographic provinces: Appalachian Plateau and Valley and Ridge
Landform: Mountains on uplands
Parent material: Residuum weathered from sandstone
Drainage class: Somewhat excessively drained
Slowest saturated hydraulic conductivity: High
Depth class: Moderately deep
Slope range: 15 to 85 percent

Associated Soils

- Alticrest soils, which have fewer rock fragments in the subsoil than the Wallen soils; on similar landforms
- Gilpin soils, which have fewer rock fragments and more clay in the subsoil than the Wallen soils; in areas of shale bedrock on similar landforms

Taxonomic Classification

Loamy-skeletal, siliceous, active, mesic Typic Dystrudepts

Typical Pedon

Wallen gravelly loam in an area of Wallen-Alticrest complex, 35 to 55 percent slopes, very stony; 1.3 miles southwest of the intersection of Highway VA-604 and the Lee-Scott County line, 0.7 mile north-northeast of the intersection of Highway VA-603 and the Lee-Scott County line, in woodland; Stickleyville, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 39 minutes 25 seconds N. and long. 82 degrees 57 minutes 59 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.
A—1 to 2 inches; dark yellowish brown (10YR 4/4) gravelly loam; weak medium granular structure; very friable, slightly sticky, slightly plastic; many medium roots; 15 percent sandstone gravel; very strongly acid; abrupt wavy boundary.
BE—2 to 7 inches; yellowish brown (10YR 5/4) very gravelly loam; weak coarse subangular blocky structure; very friable, slightly sticky, slightly plastic; many medium roots; 35 percent sandstone gravel; very strongly acid; gradual wavy boundary.
Bw—7 to 26 inches; yellowish brown (10YR 5/6) very gravelly loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; 40 percent sandstone gravel; very strongly acid; abrupt smooth boundary.
R—26 inches; sandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Reaction: Extremely acid to moderately acid
Rock fragments: Gravel, cobbles, and/or stones; content ranges from 15 to 35 percent in the A horizon and from 35 to 70 percent in the B and C horizons

A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 4
Texture (in the fine-earth fraction)—loam

BE horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam, silt loam, fine sandy loam, or sandy loam

Bw horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 6
Texture (in the fine-earth fraction)—loam, silt loam, fine sandy loam, or sandy loam

C horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 6
Texture (in the fine-earth fraction)—loam, silt loam, fine sandy loam, or sandy loam

Watahala Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from cherty limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 7 to 55 percent

Associated Soils

- Frederick soils, which have fewer chert gravel in the upper part of the subsoil and have clay at shallower depths than the Watahala soils; on similar landforms
- Carbo soils, which have fewer chert gravel in the subsoil than the Watahala soils and are moderately deep to limestone bedrock; on rocky summits and backslopes
- Timberville soils, which have fewer chert gravel in the subsoil than the Watahala soils and are darker; in depressions and drainageways

Taxonomic Classification

Fine-loamy over clayey, siliceous over mixed, subactive, mesic Typic Paleudults

Typical Pedon

Watahala gravelly loam in an area of Watahala-Frederick complex, 35 to 55 percent slopes; 0.95 mile north-northeast of the intersection of Highway VA-699 and the Virginia-Tennessee State line, 1.41 miles southeast of the intersection of Highways US-58 and VA-699, in woodland; Wheeler, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 39 seconds N. and long. 83 degrees 31 minutes 15 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.

A—1 to 3 inches; very dark grayish brown (10YR 3/2) gravelly loam; weak medium granular structure; very friable, slightly sticky, slightly plastic; common very fine roots; 25 percent chert gravel; strongly acid; abrupt smooth boundary.

E—3 to 14 inches; yellowish brown (10YR 5/4) gravelly loam; weak fine and medium granular structure; very friable, slightly sticky, slightly plastic; common very fine and medium roots; 25 percent chert gravel; very strongly acid; clear wavy boundary.

BE—14 to 23 inches; yellowish brown (10YR 5/6) gravelly loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; many distinct clay films on all faces of peds; 25 percent chert gravel; very strongly acid; clear wavy boundary.

Bt1—23 to 36 inches; yellowish brown (10YR 5/8) gravelly loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; few faint clay films on all faces of peds; 30 percent chert gravel; very strongly acid; abrupt wavy boundary.

2Bt2—36 to 63 inches; yellowish red (5YR 5/8) clay; few coarse distinct brownish yellow (10YR 6/8) mottles; moderate fine and medium subangular blocky structure; friable, moderately sticky, moderately plastic; few very fine and fine roots; few

prominent and common distinct clay films on all faces of peds; 1 percent chert gravel; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches; the depth to the 2Bt horizon ranges from 20 to 50 inches
Depth to bedrock: More than 60 inches
Reaction: Extremely acid to strongly acid in the upper part of the solum and very strongly acid or strongly acid in the 2Bt horizon
Rock fragments: Chert gravel and/or cobbles; content ranges from 15 to 35 percent in the A horizon, from 10 to 35 percent in the E, BE, and Bt horizons, and from 0 to 35 percent in the 2Bt horizon

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam

Ap horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture (in the fine-earth fraction)—loam

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture (in the fine-earth fraction)—loam or silt loam

BE horizon:
Hue—10YR
Value—5 or 6
Chroma—4 to 6
Texture (in the fine-earth fraction)—loam or silt loam

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—6 to 8
Texture (in the fine-earth fraction)—loam, silt loam, clay loam, or silty clay loam

2Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 to 6
Chroma—6 to 8
Texture (in the fine-earth fraction)—clay or silty clay that has 25 percent more clay than the overlying horizon and that has more than 43 percent clay

Weikert Series

Physiographic province: Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High

Depth class: Shallow
Slope range: 15 to 80 percent

Associated Soils

- Gilpin soils, which are moderately deep to shale bedrock and have fewer rock fragments in the subsoil than the Weikert soils; on similar landforms
- Berks soils, which are moderately deep to shale bedrock; on similar landforms
- Soils that are very deep to bedrock and have fewer rock fragments in the subsoil than the Weikert soils; on footslopes and concave head slopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts

Typical Pedon

Weikert silt loam in an area of Berks-Weikert complex, 35 to 55 percent slopes; 500 feet east of Highway US-23 at a point 0.4 mile north of Highway VA-611, in woodland; Big Stone Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 46 minutes 32 seconds N. and long. 82 degrees 49 minutes 13 seconds W.

Oe—0 to 1 inch; moderately decomposed plant material.
A—1 to 3 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many very fine and fine roots; 10 percent shale channers; strongly acid; abrupt smooth boundary.
Bw1—3 to 11 inches; dark yellowish brown (10YR 4/4) very channery silt loam; weak fine subangular blocky structure; very friable; common very fine and fine roots; 50 percent shale channers; strongly acid; clear smooth boundary.
Bw2—11 to 15 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine and medium subangular blocky structure; very friable; common very fine and fine roots; 60 percent shale channers; strongly acid; clear wavy boundary.
R—15 inches; shale bedrock.

Range in Characteristics

Solum thickness: 8 to 20 inches
Depth to bedrock: 10 to 20 inches
Reaction: Very strongly acid to moderately acid
Rock fragments: Shale channers; content ranges from 5 to 15 percent in the A horizon, from 35 to 60 percent in individual subhorizons of the B horizon, and from 60 to 85 percent in the C horizon

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam

Bw horizon:
Hue—7.5YR to 10YR
Value—4 to 6
Chroma—3 to 6
Texture (in the fine-earth fraction)—loam or silt loam

C horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture (in the fine-earth fraction)—loam or silt loam

Formation of the Soils

In this section, the factors and processes that have affected the formation and morphology of the soils in Lee County are described. The geology of the survey area is also discussed.

Factors of Soil Formation

Soils are intimate mixtures of broken and partly or completely weathered rock, minerals, organic matter, living plants and animals, water, and air *(26)*. They occur as part of the natural landscape and differ from place to place. Some of they ways in which they differ are in occurrence and degree of development of various horizons, in mineral content, in depth over bedrock, and in texture, color, and slope. The characteristics of the soils at any given area depend on the interaction of five soil-forming factors—parent material, climate, living organisms, topography, and time. Over time, topography modifies the effect of climate and living organisms on parent material *(10)*.

In theory, if all of the soil-forming factors were identical at different sites, the soils at these sites would be identical. These factors influence the genesis of every soil, but their relative importance varies from place to place. One factor may outweigh others in the formation of a soil and may determine most of its properties. For example, a very young floodplain soil may have only faint soil horizonation because of the short time the soil-forming factors have had to work. In contrast, a soil formed in residuum from bedrock on a stable landscape may have distinct horizons. The horizons of this soil are distinct because the soil material has remained largely in place and all soil-forming factors have been active for a long time. In general, however, the combined action of the five factors determines the character of each soil. The interaction of the five factors of soil formation is more complex for some soils than for others.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It is a product of weathering, or decomposition, of underlying bedrock or transported materials. Parent material influences the chemical, mineral, and textural composition of the soil. In the early stages of soil formation, a soil has properties similar to those of the parent material. As weathering takes place, the soil properties are modified and each soil develops its own characteristics. In Gilpin and Alticrest soils, parent material determines the mineral and textural composition. Gilpin soils formed in material weathered mainly from shale. Alticrest soils formed in material weathered mainly from coarse-grained sandstone. Gilpin soils have more weatherable minerals and more clay than Alticrest soils. Gilpin soils have a mixed mineralogy and are fine-loamy; Alticrest soils have a siliceous mineralogy and are coarse-loamy.

The four general types of parent material in Lee County are residuum, colluvium, alluvium, and mine spoil. Residual material weathered in place from the underlying bedrock. Colluvial material was moved by gravity from ridges and the upper slopes and was deposited on the lower slopes. Alluvial material was deposited on floodplains

and terraces by streams. Mine spoil resulted from the disturbance of land during surface mining for coal.

Residual material

Soils formed in residual material generally are on summits, shoulders, and backslopes in Lee County. Soils on stable landscapes, such as the limestone valley, have well developed properties. For example, the very deep Frederick soils are reddish and have a high clay content because they formed in weathered limestone. Carbo soils, which also formed in weathered limestone, are similar to Frederick soils but are moderately deep. Other areas of limestone bedrock in the county weathered to form soils that contain numerous chert fragments, such as Watahala soils.

Residual soils on mountains and foothills are generally shallow or moderately deep to bedrock. The moderately deep Wallen soils and the shallow Weikert soils are examples. Wallen soils are loamy-skeletal and formed in sandstone. Weikert soils are loamy-skeletal and formed in shale. Both soils are low in clay content. The sand content is high in Wallen soils but low in Weikert soils. The properties of Wallen and Weikert soils reflect the underlying parent material in which the soils formed.

Colluvial material

Colluvial material is dominantly on the lower backslopes, footslopes, and toeslopes. Some colluvium is located along intermittent drainageways in mountains. Most soils that formed in colluvium contain few to many rock fragments, are very deep, and have a subsoil ranging from clayey to loamy-skeletal. The clayey Tumbling soils, for example, formed in colluvial material that originated from the upper slopes and contained a mixture of sandstone, shale, and limestone. Other colluvial soils, such as Jefferson and Oriskany soils, formed in material containing dominantly sandstone.

Alluvial material

Alluvial material deposited by the Powell River and small streams has properties inherited from the parent material in which the deposits originated. Soils that have a high sand content are on floodplains that receive alluvium from areas containing much sandstone. Pope and Philo soils are examples. Some alluvial soils have an even mixture of sand, silt, and clay; are low in acidity; and have mixed mineralogy. These soils received alluvium from areas containing limestone, shale, and some sandstone. Lobdell and Holly soils are examples.

Mine spoil

Mine spoil is material replaced in disturbed areas strip mined for coal during the reclamation process. Mine soils are a mixture of the broken rock and soil material that were originally over the mineable coal seam. Mine soils have properties both of the overburden strata and of the original undisturbed soil. Overburden that consists dominantly of brown sandstone and brown loamy soil material produces rocky, brown, loamy mine soils. Sewell soils are an example of mine soils. Bethesda soils are an example of mine soils that formed from a mainly shale overburden. They are gray and have small amounts of sand.

Climate

Climate affects the physical, chemical, and biological relationships in soils, mainly through the influence of precipitation and temperature. Water dissolves minerals, supports biological activity, and transports minerals and organic residue through the soil. Temperature determines the type and rate of physical, chemical, and biological activities occurring in the soil. Weathering is more rapid in a warm, humid climate than in a cold or dry climate.

Because precipitation in Lee County exceeds evapotranspiration, the soils have been intensively leached. Much of the soluble materials that originally were present or were released through weathering have been removed, except in alluvial areas, which are recharged with eroded sediments from surrounding uplands. Although the bedrock in some areas contains calcium, free carbonates of lime have not accumulated in the soils because of leaching. Most of the soils in the survey area are acid.

Precipitation is the main factor in the formation of the subsoil that characterizes most of the soils in the survey area. In addition to leaching soluble materials, water that percolates through the soil moved clay from the surface layer to the subsoil. Except for soils that formed in recent alluvium or sand or on very steep slopes, all the soils in the county typically are more clayey in the subsoil than in the surface layer.

The formation of blocky structure in the subsoil of well developed soils, such as Frederick soils, is also influenced by climate. The development of peds, or aggregates, in the subsoil is caused partly by changes in volume of the soil mass resulting mainly from alternating periods of wetting and drying. Plentiful moisture also supports a productive forest. A moderate content of humus in the surface layer develops after large amounts of organic material have been returned to the soil.

Climate varies locally due to the differences in the degree and direction of slope and elevation. Generally, soils on steep uplands facing south are drier than soils on similar landscapes facing north. Soils that form in these areas may differ even if they both have the same parent material. At the higher elevations in mountainous areas, the climate may be cooler; the precipitation, particularly snowfall, is greater; and fogs are more common. In these higher, cooler areas, soils may be slightly darker and contain slightly more organic matter than soils at the lower elevations. In the higher areas, the weathering of parent materials is slower and the soils generally are thinner than the soils at the lower elevations.

Living Organisms

Biologic forces are important in the formation of soils in Lee County. Trees, shrubs, grasses, and other herbaceous plants, as well as microorganisms, earthworms, and other plant and animal life, are active agents in the soil-forming process. Climate, parent material, relief, age of the soil, and other environmental factors determine the kinds of plants and animals that live on and in the soil. Where climate or vegetation varies significantly, the soils vary accordingly.

Plants supply organic matter and transfer moisture and plant nutrients from the lower horizons to the upper horizons. Organic matter decomposes and is mixed into the soil by microorganisms and earthworms or by chemical reactions. In Lee County, the rate of decomposition is fairly rapid because of favorable temperatures, the generally abundant soil moisture, and the kinds of microorganisms in the soil. Organic matter content in the soil is moderate or low and generally ranges from 1 to 3 percent, by volume, in the surface layer.

Originally, the vegetation in Lee County was dense forest of hardwoods or mixed hardwoods and pine. The density of the stands, the proportion of different species, and the kinds of ground cover varied to some extent. The forests are not likely the reason for all of the differences in soil properties throughout the county. The leaves of deep-rooted deciduous trees vary in content of plant nutrients, but they generally return more bases and phosphorus to the soils than coniferous trees. The litter of conifers, rhododendron, and mountain laurel produces more organic acids than that of maple and oak. Soils that form under layers of acid-forming leaf litter tend to be more highly leached than other soils, and they commonly have a very low base saturation. The layer of leaf litter also helps to recycle nutrients, reduces the depth of frost penetration, increases moisture retention, and reduces the hazard of erosion on steep slopes.

As agriculture developed in Lee County, human activities, such as the clearing of

forests and the introduction of new kinds of plants, influenced soil formation. Cultivation, artificial drainage, and liming and fertilizing changed some soil characteristics. Human activities have also caused accelerated erosion. Because of this erosion, the soil in many areas is thinner and vegetation is difficult to establish. Some soil material has been washed from sloping areas down to depressions and floodplains. Young, or immature, soils, such as Timberville soils, formed in this washed material.

Other human activities that influenced soil formation in the county are coal mining and the grading, shaping, and filling required for road construction and urban development. Fairpoint, Bethesda, Sewell, and Itmann soils formed in spoil from coal mining. Udorthents formed in urban areas where the surface layer was disturbed.

Topography

Topography, or lay of the land, affects the formation of soils by causing differences in internal drainage, surface runoff, soil temperature, and geologic erosion. Topography also affects the rate at which the soils absorb radiant energy. This absorption rate, in turn, affects native vegetation. Topography alters the effect of parent material on soil formation; thus, several different kinds of soils can form from the same kind of parent material.

Slopes in Lee County range from nearly level to very steep. In the steeper areas, runoff is rapid, little water percolates through the soil, the movement of clay and the translocation of bases are slight, and soil material erodes as rapidly as it forms. Aspect varies greatly in these areas, affecting vegetation and soil formation. South-facing slopes are generally drier than north-facing slopes, and soils on these slopes retain less moisture. Berks, Wallen, and Alticrest soils formed in the steeper areas.

In the gently sloping and strongly sloping areas, the soils are generally well drained and slightly eroded. The soils in such areas are mature, having well defined horizons. Frederick and Poplimento soils are examples. Low-lying, flat areas or depressions are wetter and often ponded because of restricted drainage. Soils on colluvial slopes or within drainageways often receive runoff from nearby uplands. Lateral underground seepage from the higher areas is fairly common. Carbonates or other bases in the ground water may influence the soils. The soils on convex slopes are generally better drained. The soils on concave slopes tend to accumulate both runoff and water from internal drainage. Jefferson and Tumbling soils are examples of well drained soils on convex, colluvial slopes. Escatawba soils are an example of well drained soils on concave, colluvial slopes.

Time

The length of time that the parent material has been exposed to soil-forming processes influences the kind of soil that forms. The youngest soils in Lee County, such as Holly, Orrville, Lobdell, Chagrin, Pope, and Philo soils, formed in recent alluvium on floodplains. These soils may be stratified and have weakly expressed horizons because the soil-forming processes are interrupted by each new deposition during flooding.

Soil formation is evident even in young mine spoils. Within a few years, a weak structure develops and some rock fragments soften and are more easily crushed. Internal drainage in the mine spoil may increase as these soils continue to develop over time.

Old, strongly developed soils show well defined genetic horizons. Young, less developed soils show only faint or weakly developed horizons. The soils of Lee County range from young soils on floodplains and reclaimed strip mines to old soils on smooth uplands.

In steep and very steep areas, either creep and washing move soil material or solifluction mixes soil material before it has had sufficient time to develop a deep soil profile. As a result, shallow and weakly developed soils, such as Wallen and Weikert soils, are common on steep slopes.

Morphology of the Soils

The interaction of soil-forming factors results in distinguishable layers, or horizons, in a soil profile. The soil profile extends from the surface of the soil down to materials that are little altered by the soil-forming processes.

Most soils have three major horizons—the A, B, and C horizons. Some soils have a fourth major horizon, an E horizon, between the A and B horizons. The major horizons can be further subdivided by using letters and numbers to indicate changes within a horizon. A Bt horizon, for example, represents a layer within the B horizon consisting of translocated clay eluviated from the A and E horizons.

The A horizon, or surface layer, has the largest accumulation of organic matter.

The E horizon is the layer of maximum leaching, or eluviation, of clay and iron.

The B horizon, or subsoil, is beneath the A or E horizon. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, and other elements leached from the layers above. In some soils, the B horizon is formed by alteration in place rather than by illuviation. The oxidation and reduction of iron or the weathering of clay minerals causes the alteration. The Bt horizon is a layer of accumulated clay. Generally, it is firmer, has a finer texture and a stronger structure, and is brighter or redder than the A horizon. Most young soils do not have developed Bt horizons.

The C horizon is below the A and B horizons. It consists of material that has been little altered by the soil-forming processes but may have been modified by weathering.

Processes of Horizon Differentiation

Soils are formed as the result of the physical and chemical weathering of parent rocks and organic material, the transfer of materials, the transformation of materials, and the gains and losses of organic matter and minerals.

Soil formation begins with the physical weathering of rocks. Frost action, expansion, contraction, and other forces break large pieces of rock into smaller pieces. The rocks and rock fragments are further reduced to sand-, silt-, and clay-sized particles. These particles form the unconsolidated material in which plants can grow. When plants and animals die, organic matter is added to the mineral material.

Materials are commonly transfered from one part of the soil to another. Organic matter in suspension moves from the surface layer to the subsoil. Calcium and other elements are leached from the surface layer. To some extent, the clay in the subsoil or in the substratum holds these elements, but percolating ground water also leaches some elements from the soil. Percolating water also transfers clay from the upper horizons to the lower horizons.

The roots of plants absorb bases and store them in stems, leaves, and twigs. When plants die and decay, the elements absorbed by the plants are returned to the soil. In most soils in Lee County, the translocation and development in place of clay minerals have strongly influenced the development of soil horizons. As the soil develops, horizons gradually develop recognizable characteristics that make one horizon distinguishable from another.

The accumulation and incorporation of organic matter takes place as the plant residue decomposes. Organic matter darkens the surface layer and helps to form the A horizon. In many places much of the surface layer has been eroded away or has been mixed with materials from underlying layers through cultivation. Once lost, organic matter normally takes a long time to replace. In Lee County, the organic matter

content of the surface layer is low in Frederick and Weikert soils and moderate in Timberville soils.

Some lime and soluble salts must be leached from soils before the translocation of clay minerals and the formation of a distinct subsoil can occur. Factors that affect leaching include the kind of original salts present in the soils, the depth to which the soil solution percolates, and the texture of the soils.

One transformation is the reduction and solubilization of ferrous iron. This change takes place under wet, saturated conditions in which water replaces molecular oxygen. It mainly occurs in soils that are not well drained. Gleying, or the reduction of iron, is evident in Holly and Orrville soils, which have a dominantly gray subsoil. The gray color indicates the transformation of iron to the ferrous form and implies wetness. Reduced iron, which is soluble and mobile, commonly has been moved short distances in the soils of Lee County. It has stopped either in the horizon where it originated or in an underlying horizon. It can be partly reoxidized and segregated in the form of stains, concretions, or bright yellow and red redoxiomorphic features.

Geology and Soil Relationships

Geologic strata in Lee County consist of systems ranging in age from Pennsylvanian to Cambrian. The rocks are sedimentary in origin, and they consist mainly of sandstone, shale, siltstone, or limestone. In a few places they consist of an interbedded limestone and shale or interbedded sandstone and shale *(7, 8, 11, 13)*.

The sandstone is generally moderately hard or hard and medium grained or coarse grained. It ranges from gray to brown. Some prominent mountains, such as Powell, Cumberland, and Stone Mountains, and Wallen Ridge, are underlain partly by sandstone. The sandstone bedrock commonly outcrops near the summits of these mountains.

The lower foothills formed on shale and siltstone. These areas are at the base of mountains in the northeast and southeast parts of the county and in Poor Valley Ridge. Shale, in shades of brown, gray, black, or olive, is generally soft and typically does not outcrop above the soil surface in Lee County.

The valleys of Lee County are underlain by both pure and cherty limestone. The limestone valley is the largest area of limestone in Lee County. It lies within an area northwest of Wallen Ridge and southeast of Poor Valley Ridge, where it extends, southwest to northeast, nearly the entire length of the county. The limestone is hard and generally light grayish. Outcrops of limestone bedrock are common throughout the limestone valley.

Soil and geology in Lee County are directly related. The soils in Lee County inherited their properties from the underlying geologic strata. The weathered bedrock has formed soils unique to each geologic formation. Table 21 shows which soils occur on each geologic formation in the county *(4)*. Figures 2, 3, and 4, which are in the introductory section, show the relationship of soils, topography, and parent material of three different kinds of geologic settings in Lee County.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A floodplain or terrace landform that consist of an extensive swampy depressed area of floodplains or terraces between natural levees and adjacent valley sides.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).
Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.
Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.
Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.
Bottom land. The normal floodplain of a stream, subject to flooding.
Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.
Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.
Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.
Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.
Canopy. The leafy crown of trees or shrubs. (See Crown.)
Capillary water. Water held as a film around soil particles and in tiny spaces between

particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common

compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse-grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than

1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep soils, 20 to 40 inches; shallow soils, 10 to 20 inches; and very shallow soils, less than 10 inches.

Differential settling. Uneven settling of earthy material.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as floodplains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan (alluvial fan). A low, outspread mass of materials, commonly with gentle slopes, shaped like an open fan or a segment of a cone, deposited by a stream or intermittent drain.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal floodplain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flooding frequency classes. *None* indicates no reasonable possibility of flooding; *rare* indicates that flooding is unlikely but possible under unusual weather conditions; *occasional* indicates that flooding is expected infrequently under usual weather conditions; and *frequent* indicates that flooding is likely to occur often under usual weather conditions.

Floodplain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Floodplain step. An essentially flat, alluvial surface within a valley that is frequently covered by flood water from the present stream; any approximately horizontal surface frequently modified by scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly

managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other

material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties

of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0.015 inch
Very slow	0.0.015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse-grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key

plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The vertical or steeply sloping surface, commonly one of a series, of natural steplike landforms, as those of successive stream terraces. The steeply sloping surface between two treads.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface

runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturated hydraulic conductivity (K_{sat}). The amount of water that would move vertically through a unit area of saturated soil in unit time under unit hydraulic gradient. Terms describing saturated hydraulic conductivity, measured in inches per hour (micrometers per second), are as follows:

Very low	0.0 to 0.001417 (0.0 to 0.01)
Low	0.001417 to 0.01417 (0.01 to 0.1)
Moderately low	0.01417 to 0.1417 (0.1 to 1.0)
Moderately high	0.1417 to 1.417 (1.0 to 10)
High	1.417 to 14.7 (10 to 100)
Very high	more than 14.7 (more than 100)

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal floodplain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 or 3 percent
Gently sloping	2 to 7 percent
Strongly sloping	7 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 50 percent
Very steep	50 percent and higher

Classes for complex slopes are as follows:

Nearly level	0 to 2 or 3 percent
Undulating	2 to 7 percent
Rolling	7 to 15 percent
Hilly	15 to 25 percent
Steep	25 to 50 percent
Very steep	50 percent and higher

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil crusts. Relatively thin, somewhat continuous layers of the soil surface that often restrict water movement, air entry, and seedling emergence from the soil. They generally are less than 2 inches thick and are massive.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25

Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stream terrace (low). A terrace that is susceptible to rare flooding.

Stream terrace (high). A terrace that is not susceptible to flooding.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally

is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat or gently sloping surface of natural step-like landforms, commonly one of a series, such as successive stream terraces.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material. Fill material that is subject to differential settling.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth’s surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1961-90 at Pennington Gap, Virginia)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snow-fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January--	44.8	22.2	33.5	67	-10	51	4.14	2.36	5.72	7	7.5
February-	49.5	24.6	37.1	72	-3	79	4.34	2.72	5.80	8	5.6
March----	60.3	33.2	46.8	81	11	250	4.75	2.55	6.69	8	1.5
April----	69.6	40.3	54.9	87	20	452	4.23	2.43	5.84	7	0.7
May------	77.0	48.8	62.9	88	28	707	4.83	3.09	6.40	8	0.0
June-----	83.0	57.0	70.0	92	38	899	4.14	2.47	5.64	7	0.0
July-----	85.7	61.2	73.5	95	46	1,038	4.77	3.25	6.16	8	0.0
August---	85.1	60.2	72.7	94	45	1,013	3.76	2.25	5.11	7	0.0
September	80.3	53.7	67.0	91	34	810	3.61	1.98	5.04	6	0.0
October--	70.8	41.0	55.9	84	21	493	3.29	1.47	4.84	5	0.0
November-	59.6	33.3	46.5	79	12	230	4.05	2.20	5.69	7	0.9
December-	49.0	26.1	37.6	70	0	90	4.49	2.43	6.31	7	3.5
Yearly:											
Average	67.9	41.8	54.9	---	---	---	---	---	---	---	---
Extreme	101	-25	---	96	-12	---	---	---	---	---	---
Total--	---	---	---	---	---	6,112	50.40	43.20	56.79	85	19.7

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Pennington Gap, Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 19	May 8	May 19
2 years in 10 later than--	Apr. 13	May 2	May 14
5 years in 10 later than--	Apr. 3	Apr. 21	May 4
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 14	Oct. 3	Sept. 28
2 years in 10 earlier than--	Oct. 20	Oct. 8	Oct. 2
5 years in 10 earlier than-	Oct. 31	Oct. 18	Oct. 9

Table 3.—Growing Season

(Recorded in the period 1961-90 at Pennington Gap, Virginia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	191	159	138
8 years in 10	198	166	145
5 years in 10	210	180	158
2 years in 10	222	193	171
1 year in 10	229	200	178

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1A	Allegheny loam, 0 to 2 percent slopes, rarely flooded	1,040	0.4
1B	Allegheny loam, 2 to 7 percent slopes, rarely flooded	1,647	0.6
2D	Alticrest-Gilpin complex, 15 to 35 percent slopes	1,251	0.5
3E	Beech Grove-Rock outcrop complex, 3 to 60 percent slopes	7,645	2.9
4E	Berks-Poplimento complex, 35 to 55 percent slopes	5,566	2.1
4F	Berks-Poplimento complex, 55 to 65 percent slopes	5,838	2.2
5D	Berks-Weikert complex, 15 to 35 percent slopes	677	0.3
5E	Berks-Weikert complex, 35 to 55 percent slopes	5,455	2.1
5F	Berks-Weikert complex, 55 to 80 percent slopes	4,692	1.8
6E	Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky	5,732	2.2
7C	Carbo silt loam, 7 to 15 percent slopes	1,334	0.5
7D	Carbo silt loam, 15 to 25 percent slopes	991	0.4
8C	Carbo-Beech Grove complex, 7 to 15 percent slopes, rocky	2,664	1.0
8D	Carbo-Beech Grove complex, 15 to 25 percent slopes, rocky	6,835	2.6
8E	Carbo-Beech Grove complex, 25 to 60 percent slopes, rocky	14,250	5.5
9C	Carbo-Rock outcrop complex, 7 to 15 percent slopes	1,960	0.8
9D	Carbo-Rock outcrop complex, 15 to 25 percent slopes	3,148	1.2
9E	Carbo-Rock outcrop complex, 25 to 35 percent slopes	1,759	0.7
10A	Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded	2,038	0.8
11B	Escatawba-Jefferson complex, 2 to 7 percent slopes	1,343	0.5
11C	Escatawba-Jefferson complex, 7 to 15 percent slopes	2,992	1.1
12B	Frederick gravelly loam, 2 to 7 percent slopes	595	0.2
12C	Frederick gravelly loam, 7 to 15 percent slopes	3,939	1.5
12D	Frederick gravelly loam, 15 to 25 percent slopes	11,962	4.6
12E	Frederick gravelly loam, 25 to 35 percent slopes	5,381	2.1
12F	Frederick gravelly loam, 35 to 60 percent slopes	2,817	1.1
13B	Frederick silt loam, 2 to 7 percent slopes	462	0.2
13C	Frederick silt loam, 7 to 15 percent slopes	2,988	1.1
13D	Frederick silt loam, 15 to 25 percent slopes	5,115	2.0
13E	Frederick silt loam, 25 to 35 percent slopes	5,703	2.2
13F	Frederick silt loam, 35 to 60 percent slopes	1,089	0.4
14B	Frederick silt loam, karst, 2 to 7 percent slopes	1,968	0.8
14C	Frederick silt loam, karst, 7 to 15 percent slopes	4,105	1.6
14D	Frederick silt loam, karst, 15 to 25 percent slopes	2,060	0.8
14E	Frederick silt loam, karst, 25 to 60 percent slopes	34	*
15C	Frederick-Carbo complex, 7 to 15 percent slopes, rocky	1,659	0.6
15D	Frederick-Carbo complex, 15 to 25 percent slopes, rocky	2,388	0.9
15E	Frederick-Carbo complex, 25 to 35 percent slopes, rocky	5,841	2.2
15F	Frederick-Carbo complex, 35 to 60 percent slopes, rocky	821	0.3
16C	Gilpin silt loam, 7 to 15 percent slopes	270	0.1
16D	Gilpin silt loam, 15 to 35 percent slopes	1,193	0.5
16E	Gilpin silt loam, 35 to 55 percent slopes	8,197	3.1
17D	Gilpin-Berks complex, 15 to 35 percent slopes	1,795	0.7
17E	Gilpin-Berks complex, 35 to 55 percent slopes	15,859	6.1
17F	Gilpin-Berks complex, 55 to 70 percent slopes	4,271	1.6
18A	Holly loam, 0 to 2 percent slopes, frequently flooded	1,017	0.4
19E	Itmann extremely channery sandy loam, 0 to 80 percent slopes	263	0.1
20D	Jefferson loam, 15 to 35 percent slopes, very stony	4,385	1.7
21A	Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded	2,874	1.1
22C	Oriskany cobbly loam, 7 to 15 percent slopes, extremely stony	160	*
22E	Oriskany cobbly loam, 35 to 55 percent slopes, extremely stony	7,221	2.8
23A	Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded	696	0.3
24D	Pineville channery loam, 15 to 35 percent slopes, very stony	2,163	0.8
24E	Pineville channery loam, 35 to 55 percent slopes, very stony	1,689	0.6
25	Pits, quarries	213	*
26A	Pope fine sandy loam, 0 to 3 percent slopes, occasionally flooded	510	0.2
27D	Poplimento-Berks complex, 15 to 35 percent slopes	2,179	0.8
27E	Poplimento-Berks complex, 35 to 55 percent slopes	2,681	1.0
28B	Shottower silt loam, 2 to 7 percent slopes	845	0.3
28C	Shottower silt loam, 7 to 15 percent slopes	2,551	1.0

See footnote at end of table.

Table 4.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
28D	Shottower silt loam, 15 to 25 percent slopes	638	0.2
29B	Timberville silt loam, 2 to 7 percent slopes, frequently flooded	2,576	1.0
29C	Timberville silt loam, 7 to 15 percent slopes	2,429	0.9
30C	Tumbling loam, 7 to 15 percent slopes	4,194	1.6
30D	Tumbling loam, 15 to 25 percent slopes	3,500	1.3
31C	Tumbling loam, 7 to 15 percent slopes, very stony	215	*
31D	Tumbling loam, 15 to 25 percent slopes, very stony	1,218	0.5
31E	Tumbling loam, 25 to 35 percent slopes, very stony	7,300	2.8
32	Udorthents	152	*
33	Urban land-Udorthents complex	547	0.2
34D	Wallen-Alticrest complex, 15 to 35 percent slopes, very stony	1,860	0.7
34E	Wallen-Alticrest complex, 35 to 55 percent slopes, very stony	5,199	2.0
35F	Wallen-Rock outcrop complex, 35 to 85 percent slopes, very stony	8,953	3.4
36C	Watahala-Frederick complex, 7 to 15 percent slopes	4,235	1.6
36D	Watahala-Frederick complex, 15 to 35 percent slopes	10,030	3.8
36E	Watahala-Frederick complex, 35 to 55 percent slopes	7,920	3.0
W	Water	818	0.3
	Total	260,600	100.0

* Less than 0.1 percent.

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture

Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
1A:							
Allegheny	1	L	6.0	130	4.0	7.5	2700
1B:							
Allegheny	2e	L	6.0	130	4.0	7.5	2500
2D:							
Alticrest	6e	FF	---	---	---	3.5	---
Gilpin	6e	U	---	---	---	4.5	---
3E:							
Beech Grove	7s	JJ	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---
4E, 4F:							
Berks	7e	JJ	---	---	---	---	---
Poplimento	7e	M	---	---	---	---	---
5D:							
Berks	6e	JJ	---	---	---	3.5	---
Weikert	6e	JJ	---	---	---	2.5	---
5E, 5F:							
Berks	7e	JJ	---	---	---	---	---
Weikert	7e	JJ	---	---	---	---	---
6E:							
Bethesda	7e	JJ	---	---	---	---	---
Fairpoint	7e	JJ	---	---	---	---	---
Sewell	7e	JJ	---	---	---	---	---
7C:							
Carbo	3e	Y	---	90	3.0	5.0	---
7D:							
Carbo	4e	Y	---	80	2.8	4.5	---
8C:							
Carbo	3e	Y	---	80	2.8	5.0	---
Beech Grove	6s	JJ	---	---	---	2.0	---
8D:							
Carbo	4e	Y	---	70	2.5	4.5	---
Beech Grove	6s	JJ	---	---	---	1.5	---

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
8E:							
Carbo	7e	Y	---	---	---	---	---
Beech Grove	7e	JJ	---	---	---	---	---
9C, 9D, 9E:							
Carbo	7s	Y	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---
10A:							
Chagrin	1	A	6.0	160	4.5	9.0	2000
Lobdell	2w	G	---	140	4.5	8.0	1500
11B:							
Escatawba	2e	L	6.0	130	4.0	7.5	1500
Jefferson	2e	L	6.0	130	4.0	7.5	2200
11C:							
Escatawba	3e	L	5.0	115	3.5	6.5	1500
Jefferson	3e	L	5.0	115	3.5	6.5	2200
12B:							
Frederick	2e	M	5.5	115	3.5	8.0	2500
12C:							
Frederick	3e	M	5.0	105	3.0	7.0	2300
12D:							
Frederick	4e	M	4.5	95	3.0	6.5	2000
12E:							
Frederick	6e	M	---	---	---	6.0	---
12F:							
Frederick	7e	M	---	---	---	---	---
13B:							
Frederick	2e	M	6.0	130	4.0	8.5	2800
13C:							
Frederick	3e	M	5.5	115	3.5	7.5	2600
13D:							
Frederick	4e	M	5.0	105	3.0	7.0	2300
13E:							
Frederick	6e	M	---	---	---	6.5	---
13F:							
Frederick	7e	M	---	---	---	---	---
14B:							
Frederick	2e	M	6.0	---	4.0	8.5	---

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
14C:							
Frederick---------	3e	M	5.5	---	3.5	7.5	---
14D:							
Frederick---------	4e	M	5.0	---	3.0	7.0	---
14E:							
Frederick---------	7e	M	---	---	---	---	---
15C:							
Frederick---------	3e	M	5.0	105	3.0	7.5	2600
Carbo-------------	3e	Y	---	80	2.8	5.0	---
15D:							
Frederick---------	4e	M	4.5	95	3.0	7.0	2300
Carbo-------------	4e	Y	---	70	2.5	4.5	---
15E:							
Frederick---------	6e	M	---	---	---	6.5	---
Carbo-------------	6e	Y	---	---	---	4.0	---
15F:							
Frederick---------	7e	M	---	---	---	---	---
Carbo-------------	7e	Y	---	---	---	---	---
16C:							
Gilpin------------	3e	U	3.5	95	3.0	5.0	---
16D:							
Gilpin------------	6e	U	---	---	---	4.5	---
16E:							
Gilpin------------	7e	U	---	---	---	---	---
17D:							
Gilpin------------	6e	U	---	---	---	4.5	---
Berks-------------	6e	JJ	---	---	---	3.5	---
17E, 17F:							
Gilpin------------	7e	U	---	---	---	---	---
Berks-------------	7e	JJ	---	---	---	---	---
18A:							
Holly-------------	6w	NN	---	---	---	3.5	---
19E:							
Itmann------------	7e	JJ	---	---	---	---	---
20D:							
Jefferson---------	7s	L	---	---	---	---	---

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
21A:							
Lobdell-----------	2w	G	---	140	4.5	8.0	1500
Orrville----------	4w	HH	---	85	2.5	4.0	---
22C:							
Oriskany----------	7s	CC	---	---	---	---	---
22E:							
Oriskany----------	7e	CC	---	---	---	---	---
23A:							
Philo-------------	2w	H	---	140	3.0	4.0	---
24D:							
Pineville---------	7s	L	---	---	---	---	---
24E:							
Pineville---------	7e	L	---	---	---	---	---
25.							
Pits							
26A:							
Pope--------------	1	A	6.0	160	4.5	7.5	1700
27D:							
Poplimento--------	6e	M	---	---	---	6.0	---
Berks-------------	6e	JJ	---	---	---	3.5	---
27E:							
Poplimento--------	7e	M	---	---	---	---	---
Berks-------------	7e	JJ	---	---	---	---	---
28B:							
Shottower---------	2e	O	5.5	130	4.0	7.5	2700
28C:							
Shottower---------	3e	O	5.0	115	3.5	7.0	2600
28D:							
Shottower---------	4e	O	4.5	105	3.0	6.5	2100
29B:							
Timberville-------	2w	G	5.5	140	4.5	9.0	3200
29C:							
Timberville-------	3e	G	5.0	125	4.0	9.0	3100
30C:							
Tumbling----------	3e	O	5.0	115	3.5	7.0	2600
30D:							
Tumbling----------	4e	O	4.5	105	3.0	6.5	2200
31C:							
Tumbling----------	6s	O	---	---	---	6.5	---

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
31D, 31E:							
Tumbling----------	7s	O	---	---	---	---	---
32. Udorthents							
33. Urban land-Udorthents							
34D:							
Wallen------------	7s	JJ	---	---	---	---	---
Alticrest---------	7s	FF	---	---	---	---	---
34E:							
Wallen------------	7e	JJ	---	---	---	---	---
Alticrest---------	7e	FF	---	---	---	---	---
35F:							
Wallen------------	7s	JJ	---	---	---	---	---
Rock outcrop------	8s	---	---	---	---	---	---
36C:							
Watahala----------	3e	M	5.0	105	3.0	6.5	2000
Frederick---------	3e	M	5.0	105	3.0	7.0	2300
36D:							
Watahala----------	6e	M	---	---	---	6.0	---
Frederick---------	6e	M	---	---	---	6.5	---
36E:							
Watahala----------	7e	M	---	---	---	---	---
Frederick---------	7e	M	---	---	---	---	---
W. Water							

Table 6.—Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Map unit name
1A	Allegheny loam, 0 to 2 percent slopes, rarely flooded
1B	Allegheny loam, 2 to 7 percent slopes, rarely flooded
10A	Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded
11B	Escatawba-Jefferson complex, 2 to 7 percent slopes
12B	Frederick gravelly loam, 2 to 7 percent slopes
13B	Frederick silt loam, 2 to 7 percent slopes
14B	Frederick silt loam, karst, 2 to 7 percent slopes
21A	Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded
23A	Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded
26A	Pope fine sandy loam, 0 to 3 percent slopes, occasionally flooded
28B	Shottower silt loam, 2 to 7 percent slopes

Table 7.—Agricultural Waste Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1A, 1B:					
Allegheny	95	Somewhat limited		Very limited	
		Too acid	0.73	Too acid	1.00
				Flooding	0.40
2D:					
Alticrest	70	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Filtering capacity	0.99	Slope	1.00
				Too acid	1.00
		Droughty	0.91		
Gilpin	25	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Depth to bedrock	0.54	Slope	1.00
		Droughty	0.53	Too acid	0.85
3E:					
Beech Grove	55	Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00
		Slope	1.00	Low adsorption	1.00
Rock outcrop	35	Not rated		Not rated	
4E, 4F:					
Berks	60	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00
Poplimento	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Too acid	0.96
				Slow water movement	0.37
		Too acid	0.37		
5D, 5E, 5F:					
Berks	55	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00
Weikert	35	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
6E:					
Bethesda------------	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Droughty	0.98	Droughty	0.98
		Slow water movement	0.43	Too acid	0.77
Fairpoint-----------	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Dense layer	1.00	Slow water movement	0.32
		Slow water movement	0.43		
Sewell--------------	15	Very limited		Very limited	
		Large stones on the surface	1.00	Large stones on the surface	1.00
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Too acid	0.96
7C:					
Carbo---------------	80	Very limited		Very limited	
		Slow water movement	1.00	Low adsorption	1.00
				Slow water movement	1.00
		Droughty	0.83		
		Depth to bedrock	0.65	Droughty	0.83
7D:					
Carbo---------------	75	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
				Slow water movement	1.00
		Droughty	0.83		
8C:					
Carbo---------------	75	Very limited		Very limited	
		Slow water movement	1.00	Low adsorption	1.00
				Slow water movement	1.00
		Droughty	0.83		
		Depth to bedrock	0.65	Droughty	0.83
Beech Grove---------	20	Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00
		Slope	0.63	Low adsorption	1.00
8D:					
Carbo---------------	75	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
				Slow water movement	1.00
		Droughty	0.83		
Beech Grove---------	20	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
8E:					
Carbo	60	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
		Droughty	0.83	Slow water movement	1.00
Beech Grove	30	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00
9C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Low adsorption	1.00
		Droughty	0.83	Slow water movement	1.00
		Depth to bedrock	0.65	Droughty	0.83
Rock outcrop	15	Not rated		Not rated	
9D, 9E:					
Carbo	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
		Droughty	0.83	Slow water movement	1.00
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
Lobdell	25	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	0.99
		Too acid	0.02	Too acid	0.07
11B:					
Escatawba	70	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Too acid	0.96
		Slow water movement	0.50	Depth to saturated zone	0.86
		Too acid	0.37	Slow water movement	0.37
Jefferson	25	Somewhat limited		Somewhat limited	
		Too acid	0.11	Too acid	0.42
11C:					
Escatawba	60	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Too acid	0.96
		Slope	0.63	Depth to saturated zone	0.86
		Slow water movement	0.50	Slope	0.63

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
11C:					
Jefferson-----------	35	Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63
		Too acid	0.11	Too acid	0.42
12B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Too acid	0.11	Too acid	0.42
12C:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
12D, 12E, 12F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
13B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Too acid	0.11	Too acid	0.42
13C:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
13D, 13E, 13F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
14B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Too acid	0.11	Too acid	0.42
14C:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
14D, 14E:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
15C:					
Frederick-----------	70	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
Carbo---------------	20	Very limited		Very limited	
		Slow water movement	1.00	Low adsorption	1.00
		Droughty	0.83	Slow water movement	1.00
		Depth to bedrock	0.65	Droughty	0.83

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
15D:					
Frederick	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
Carbo	20	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
		Droughty	0.83	Slow water movement	1.00
15E, 15F:					
Frederick	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
Carbo	30	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Slow water movement	1.00	Slope	1.00
		Droughty	0.83	Slow water movement	1.00
16C:					
Gilpin	90	Somewhat limited		Very limited	
		Slope	0.63	Low adsorption	1.00
		Depth to bedrock	0.54	Too acid	0.85
		Droughty	0.53	Slope	0.63
16D, 16E:					
Gilpin	90	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Depth to bedrock	0.54	Slope	1.00
		Droughty	0.53	Too acid	0.85
17D:					
Gilpin	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Depth to bedrock	0.54	Slope	1.00
		Droughty	0.53	Too acid	0.85
Berks	15	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00
17E:					
Gilpin	70	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Depth to bedrock	0.54	Slope	1.00
		Droughty	0.53	Too acid	0.85
Berks	25	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
17F:					
Gilpin	60	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Depth to bedrock	0.54	Slope	1.00
		Droughty	0.53	Too acid	0.85
Berks	35	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00
18A:					
Holly	95	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00
19E:					
Itmann	95	Very limited		Very limited	
		Droughty	1.00	Too acid	1.00
		Slope	1.00	Droughty	1.00
		Too acid	0.73	Slope	1.00
20D:					
Jefferson	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Too acid	0.42
		Too acid	0.11		
21A:					
Lobdell	65	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	0.99
		Too acid	0.02	Too acid	0.07
Orrville	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00
		Too acid	0.05	Too acid	0.21
22C:					
Oriskany	90	Very limited		Somewhat limited	
		Large stones content	1.00	Too acid	0.96
		Slope	0.63	Slope	0.63
		Too acid	0.37		
22E:					
Oriskany	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Too acid	0.96
		Too acid	0.37		

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
23A:					
Philo	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00
		Too acid	0.37	Too acid	0.96
24D, 24E:					
Pineville	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Too acid	0.42
		Too acid	0.11	Droughty	0.01
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
		Too acid	0.37	Too acid	0.96
27D, 27E:					
Poplimento	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Too acid	0.96
		Too acid	0.37	Slow water movement	0.37
Berks	30	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.54	Droughty	1.00
28B:					
Shottower	95	Somewhat limited		Somewhat limited	
		Low adsorption	0.56	Too acid	0.42
		Too acid	0.11	Low adsorption	0.13
28C:					
Shottower	95	Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63
		Low adsorption	0.56	Too acid	0.42
		Too acid	0.11	Low adsorption	0.13
28D:					
Shottower	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Low adsorption	0.56	Too acid	0.42
		Too acid	0.11	Low adsorption	0.13
29B:					
Timberville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too acid	0.11	Too acid	0.42

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
29C:					
Timberville	90	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
30C:					
Tumbling	90	Somewhat limited		Somewhat limited	
		Low adsorption	0.48	Too acid	0.96
		Too acid	0.37	Slope	0.37
		Slope	0.37	Low adsorption	0.11
30D:					
Tumbling	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Low adsorption	0.48	Too acid	0.96
		Too acid	0.37	Low adsorption	0.11
31C:					
Tumbling	90	Somewhat limited		Somewhat limited	
		Large stones content	0.94	Too acid	0.96
				Slope	0.37
		Low adsorption	0.48	Low adsorption	0.11
		Too acid	0.37		
31D, 31E:					
Tumbling	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.94	Too acid	0.96
				Low adsorption	0.11
		Low adsorption	0.48		
32:					
Udorthents	85	Not rated		Not rated	
33:					
Urban land	70	Not rated		Not rated	
Udorthents	20	Not rated		Not rated	
34D, 34E:					
Wallen	55	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Droughty	1.00	Low adsorption	1.00
		Large stones content	0.94	Slope	1.00
Alticrest	35	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Filtering capacity	0.99	Slope	1.00
				Too acid	1.00
		Large stones content	0.94		

Table 7.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
35F:					
Wallen	80	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Droughty	1.00	Low adsorption	1.00
		Large stones content	0.94	Slope	1.00
Rock outcrop	15	Not rated		Not rated	
36C:					
Watahala	75	Somewhat limited		Very limited	
		Too acid	0.78	Too acid	1.00
		Slope	0.37	Slope	0.37
		Droughty	0.34	Droughty	0.34
Frederick	20	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
36D, 36E:					
Watahala	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.78	Too acid	1.00
		Droughty	0.34	Droughty	0.34
Frederick	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
W:					
Water	100	Not rated		Not rated	

Table 7.—Agricultural Waste Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
1A:					
Allegheny-----------	95	Very limited		Very limited	
		Too acid	1.00	Seepage	1.00
				Too acid	1.00
				Flooding	0.40
1B:					
Allegheny-----------	95	Very limited		Very limited	
		Too acid	1.00	Seepage	1.00
		Too steep	0.32	Too acid	1.00
				Flooding	0.40
2D:					
Alticrest-----------	70	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	1.00	Depth to bedrock	1.00
				Too steep	1.00
Gilpin--------------	25	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Too steep	1.00
				Seepage	1.00
3E:					
Beech Grove---------	55	Very limited		Very limited	
		Droughty	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Too steep	1.00	Too steep	1.00
Rock outcrop--------	35	Not rated		Not rated	
4E, 4F:					
Berks---------------	60	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
Poplimento----------	30	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Too acid	0.96	Seepage	1.00
				Too acid	0.96
5D, 5E, 5F:					
Berks---------------	55	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
Weikert-------------	35	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too steep	1.00	Too steep	1.00

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
6E:					
Bethesda	60	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Droughty	0.98	Too acid	0.77
				Seepage	0.67
Fairpoint	20	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Slow water movement	0.32	Seepage	0.67
Sewell	15	Very limited		Very limited	
		Large stones on the surface	1.00	Seepage	1.00
				Stone content	1.00
		Too steep	1.00	Too steep	1.00
7C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Seepage	1.00
		Too steep	1.00	Too steep	1.00
		Droughty	0.83		
7D:					
Carbo	75	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00
8C:					
Carbo	75	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Seepage	1.00
		Too steep	1.00	Too steep	1.00
		Droughty	0.83		
Beech Grove	20	Very limited		Very limited	
		Droughty	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00
		Too steep	1.00	Too steep	1.00
8D:					
Carbo	75	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00
Beech Grove	20	Very limited		Very limited	
		Droughty	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too steep	1.00	Seepage	1.00
8E:					
Carbo	60	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
8E:					
Beech Grove	30	Very limited		Very limited	
		Droughty	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too steep	1.00	Seepage	1.00
9C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Seepage	1.00
		Too steep	1.00	Too steep	1.00
		Droughty	0.83		
Rock outcrop	15	Not rated		Not rated	
9D, 9E:					
Carbo	80	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
				Seepage	1.00
Lobdell	25	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
				Seepage	1.00
		Flooding	0.60	Depth to saturated zone	0.99
		Too acid	0.07		
11B:					
Escatawba	70	Somewhat limited		Very limited	
		Too acid	0.96	Seepage	1.00
		Depth to saturated zone	0.86	Too acid	0.96
				Depth to saturated zone	0.86
		Slow water movement	0.37		
Jefferson	25	Somewhat limited		Very limited	
		Too acid	0.42	Seepage	1.00
		Too steep	0.32	Too acid	0.42
11C:					
Escatawba	60	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.96	Too steep	1.00
		Depth to saturated zone	0.86	Too acid	0.96
Jefferson	35	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
12B:					
Frederick-----------	95	Somewhat limited		Very limited	
		Too acid	0.42	Seepage	1.00
		Too steep	0.32	Too acid	0.42
12C:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42
12D, 12E, 12F:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
13B:					
Frederick-----------	95	Somewhat limited		Very limited	
		Too acid	0.42	Seepage	1.00
		Too steep	0.32	Too acid	0.42
13C:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42
13D, 13E, 13F:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
14B:					
Frederick-----------	95	Somewhat limited		Very limited	
		Too acid	0.42	Seepage	1.00
		Too steep	0.32	Too acid	0.42
14C:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42
14D, 14E:					
Frederick-----------	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
15C:					
Frederick-----------	70	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
15C:					
Carbo	20	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Seepage	1.00
		Too steep	1.00	Too steep	0.94
		Droughty	0.83		
15D:					
Frederick	70	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
Carbo	20	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00
15E, 15F:					
Frederick	65	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
Carbo	30	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Seepage	1.00
16C:					
Gilpin	90	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Seepage	1.00
				Too steep	1.00
16D, 16E:					
Gilpin	90	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Too steep	1.00
				Seepage	1.00
17D:					
Gilpin	80	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Too steep	1.00
				Seepage	1.00
Berks	15	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
17E:					
Gilpin	70	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Too steep	1.00
				Seepage	1.00

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
17E:					
Berks	25	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
17F:					
Gilpin	60	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Too acid	0.85	Too steep	1.00
				Seepage	1.00
Berks	35	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
18A:					
Holly	95	Very limited		Very limited	
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
19E:					
Itmann	95	Very limited		Very limited	
		Too acid	1.00	Seepage	1.00
		Droughty	1.00	Too acid	1.00
		Too steep	1.00	Too steep	1.00
20D:					
Jefferson	85	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
21A:					
Lobdell	65	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
		Flooding	0.60	Seepage	1.00
		Too acid	0.07	Depth to saturated zone	0.99
Orrville	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	1.00
		Too acid	0.21	Seepage	1.00
22C:					
Oriskany	90	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.96	Cobble content	1.00
				Too steep	1.00

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
22E:					
Oriskany	90	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.96	Too steep	1.00
				Cobble content	1.00
23A:					
Philo	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00
		Too acid	0.96	Depth to saturated zone	1.00
		Flooding	0.60	Seepage	1.00
24D, 24E:					
Pineville	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Somewhat limited		Very limited	
		Too acid	0.96	Flooding	1.00
		Flooding	0.60	Seepage	1.00
				Too acid	0.96
27D, 27E:					
Poplimento	60	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Too acid	0.96	Seepage	1.00
				Too acid	0.96
Berks	30	Very limited		Very limited	
		Too steep	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep	1.00
				Seepage	1.00
28B:					
Shottower	95	Somewhat limited		Very limited	
		Low adsorption	0.56	Seepage	1.00
		Too acid	0.42	Low adsorption	0.56
		Too steep	0.32	Too acid	0.42
28C:					
Shottower	95	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Low adsorption	0.56	Too steep	1.00
				Low adsorption	0.56
28D:					
Shottower	90	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Low adsorption	0.56	Seepage	1.00
				Low adsorption	0.56

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
29B:					
Timberville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too acid	0.42	Seepage	1.00
		Too steep	0.32	Too acid	0.42
29C:					
Timberville	90	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42
30C:					
Tumbling	90	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
				Too steep	0.94
30D:					
Tumbling	90	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Too acid	0.96	Seepage	1.00
				Too acid	0.96
31C:					
Tumbling	90	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
				Too steep	0.94
31D, 31E:					
Tumbling	90	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Too acid	0.96	Seepage	1.00
				Too acid	0.96
32:					
Udorthents	85	Not rated		Not rated	
33:					
Urban land	70	Not rated		Not rated	
Udorthents	20	Not rated		Not rated	
34D, 34E:					
Wallen	55	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Too steep	1.00	Depth to bedrock	1.00
				Too steep	1.00
Alticrest	35	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	1.00	Depth to bedrock	1.00
				Too steep	1.00

Table 7.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
35F:					
Wallen	80	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Too steep	1.00	Depth to bedrock	1.00
				Too steep	1.00
Rock outcrop	15	Not rated		Not rated	
36C:					
Watahala	75	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	1.00	Too acid	1.00
				Too steep	0.94
Frederick	20	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	0.94
				Too acid	0.42
36D, 36E:					
Watahala	80	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	1.00	Too steep	1.00
				Too acid	1.00
Frederick	15	Very limited		Very limited	
		Too steep	1.00	Seepage	1.00
		Too acid	0.42	Too steep	1.00
				Too acid	0.42
W:					
Water	100	Not rated		Not rated	

Table 7.—Agricultural Waste Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
1A:					
Allegheny	95	Very limited		Very limited	
		Slow water movement	1.00	Too acid	1.00
		Too acid	0.14		
1B:					
Allegheny	95	Very limited		Very limited	
		Slow water movement	1.00	Too acid	1.00
				Too steep	0.32
		Too acid	0.14		
		Slope	0.12		
2D:					
Alticrest	70	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
				Filtering capacity	0.99
Gilpin	25	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
3E:					
Beech Grove	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00		
Rock outcrop	35	Not rated		Not rated	
4E, 4F:					
Berks	60	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
Poplimento	30	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
				Slow water movement	0.26

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
5D, 5E, 5F:					
Berks	55	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
Weikert	35	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.67
6E:					
Bethesda	60	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.77
		Slope	1.00	Slow water movement	0.22
		Stone content	0.01		
Fairpoint	20	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Slow water movement	0.22
		Slope	1.00		
Sewell	15	Very limited		Very limited	
		Stone content	1.00	Large stones on the surface	1.00
		Slope	1.00		
				Too steep	1.00
				Too acid	0.96
7C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
		Slope	1.00		
				Too acid	0.31
7D:					
Carbo	75	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Slow water movement	0.96
		Depth to bedrock	1.00		
				Too acid	0.31
8C:					
Carbo	75	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
		Slope	1.00		
				Too acid	0.31
Beech Grove	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00		

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
8D:					
Carbo	75	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
				Too acid	0.31
Beech Grove	20	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00		
8E:					
Carbo	60	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
				Too acid	0.31
Beech Grove	30	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00		
9C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slope	1.00	Slow water movement	0.96
				Too acid	0.31
Rock outcrop	15	Not rated		Not rated	
9D, 9E:					
Carbo	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
				Too acid	0.31
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Flooding	0.60
		Slow water movement	1.00		
		Flooding	0.60		

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
10A:					
Lobdell-------------	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60	Too acid	0.07
11B:					
Escatawba-----------	70	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.96
		Depth to saturated zone	0.86	Depth to saturated zone	0.86
		Slope	0.12	Too steep	0.32
		Too acid	0.03	Slow water movement	0.26
Jefferson-----------	25	Somewhat limited		Somewhat limited	
		Slow water movement	0.32	Too acid	0.42
		Slope	0.12	Too steep	0.32
11C:					
Escatawba-----------	60	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.96
		Depth to saturated zone	0.86	Depth to saturated zone	0.86
		Too acid	0.03	Slow water movement	0.26
Jefferson-----------	35	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.42
12B:					
Frederick-----------	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.42
		Slope	0.12	Too steep	0.32
12C:					
Frederick-----------	95	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.42
12D, 12E, 12F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
13B:					
Frederick-----------	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.42
		Slope	0.12	Too steep	0.32

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
13C:					
Frederick-----------	95	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.42
		Slope	1.00		
13D, 13E, 13F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
14B:					
Frederick-----------	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.42
				Too steep	0.32
		Slope	0.12		
14C:					
Frederick-----------	95	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.42
		Slope	1.00		
14D, 14E:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
15C:					
Frederick-----------	70	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.42
		Slope	1.00		
Carbo---------------	20	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
				Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
		Slope	1.00		
				Too acid	0.31
15D:					
Frederick-----------	70	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
Carbo---------------	20	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Slow water movement	0.96
		Depth to bedrock	1.00		
				Too acid	0.31

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
15E, 15F:					
Frederick	65	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
Carbo	30	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.96
				Too acid	0.31
16C:					
Gilpin	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.85
16D, 16E:					
Gilpin	90	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
17D:					
Gilpin	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
Berks	15	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
17E:					
Gilpin	70	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
Berks	25	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
17F:					
Gilpin	60	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
17F:					
Berks	35	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
18A:					
Holly	95	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.07
19E:					
Itmann	95	Very limited		Very limited	
		Slope	1.00	Too acid	1.00
				Too steep	1.00
20D:					
Jefferson	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.42
21A:					
Lobdell	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60	Too acid	0.07
Orrville	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60	Too acid	0.21
22C, 22E:					
Oriskany	90	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Cobble content	1.00	Too acid	0.96
		Slow water movement	0.32		
23A:					
Philo	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Too acid	0.96
		Slow water movement	0.32	Flooding	0.60

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
24D, 24E:					
Pineville	95	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.42
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.62	Too acid	0.96
		Flooding	0.60	Flooding	0.60
27D, 27E:					
Poplimento	60	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
				Slow water movement	0.26
Berks	30	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	0.96
28B:					
Shottower	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Low adsorption	0.56
				Too acid	0.42
		Slope	0.12	Too steep	0.32
28C:					
Shottower	95	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Low adsorption	0.56
		Slope	1.00	Too acid	0.42
28D:					
Shottower	90	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Low adsorption	0.56
				Too acid	0.42
29B:					
Timberville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.42
				Too steep	0.32
		Slope	0.12		
29C:					
Timberville	90	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.42
		Slope	1.00		

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
30C:					
Tumbling------------	90	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00	Low adsorption	0.48
30D:					
Tumbling------------	90	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
				Low adsorption	0.48
31C:					
Tumbling------------	90	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00	Low adsorption	0.48
31D, 31E:					
Tumbling------------	90	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
				Low adsorption	0.48
32:					
Udorthents----------	85	Not rated		Not rated	
33:					
Urban land----------	70	Not rated		Not rated	
Udorthents----------	20	Not rated		Not rated	
34D, 34E:					
Wallen--------------	55	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
Alticrest-----------	35	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
				Filtering capacity	0.99
35F:					
Wallen--------------	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
Rock outcrop--------	15	Not rated		Not rated	

Table 7.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
36C:					
Watahala	75	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	1.00
		Too acid	0.21		
Frederick	20	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.42
36D, 36E:					
Watahala	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	1.00
		Too acid	0.21		
Frederick	15	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42
W:					
Water	100	Not rated		Not rated	

Table 8.—Forestland Productivity

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
1A, 1B:				
Allegheny	yellow-poplar	100	107	white ash, walnut, yellow-poplar
	walnut	80	62	
	white ash	95	---	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
2D:				
Alticrest	chestnut oak	55	39	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	55	39	
	black oak	55	39	
	white oak	55	39	
	Virginia pine	---	---	
	pitch pine	---	---	
Gilpin	northern red oak	70	52	northern red oak, eastern white pine, white oak, yellow-poplar
	black oak	65	47	
	red maple	80	62	
	white oak	65	47	
	yellow-poplar	85	80	
	hickory	---	---	
3E:				
Beech Grove	chestnut oak	50	35	chestnut oak, eastern white pine, white oak
	eastern redcedar	35	40	
	scarlet oak	50	35	
	white oak	---	---	
Rock outcrop.				
4E, 4F:				
Berks	northern red oak	65	47	northern red oak, black oak, white oak, eastern white pine
	black oak	60	43	
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
Poplimento	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	90	90	
	black cherry	---	---	
5D, 5E, 5F:				
Berks	black oak	60	43	black oak, white oak, eastern white pine
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
Weikert	chestnut oak	50	35	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	50	35	
	black oak	50	35	
	white oak	50	35	
	Virginia pine	---	---	
	pitch pine	---	---	

Table 8.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
6E:				
Bethesda	northern red oak	---	---	northern red oak, eastern white pine, yellow-poplar
	yellow-poplar	---	---	
	black locust	---	---	
Fairpoint	northern red oak	---	---	northern red oak, eastern white pine, yellow-poplar
	yellow-poplar	---	---	
	black locust	---	---	
Sewell	northern red oak	---	---	northern red oak, eastern white pine, yellow-poplar
	yellow-poplar	---	---	
	black locust	---	---	
	red maple	---	---	
	American sycamore	---	---	
7C, 7D:				
Carbo	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	
8C, 8D, 8E:				
Carbo	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	
Beech Grove	chestnut oak	50	35	chestnut oak, eastern white pine, white oak
	eastern redcedar	35	40	
	scarlet oak	50	35	
	white oak	---	---	
9C, 9D, 9E:				
Carbo	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	
Rock outcrop.				
10A:				
Chagrin	yellow-poplar	100	107	walnut, yellow-poplar
	black walnut	85	65	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	

Table 8.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
10A:				
Lobdell	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
11B, 11C:				
Escatawba	northern red oak	75	57	northern red oak, eastern white pine, white ash, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white ash	85	65	
	white oak	70	52	
	yellow-poplar	90	90	
Jefferson	northern red oak	85	65	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	80	62	
	yellow-poplar	95	98	
12B, 12C, 12D, 12E, 12F, 13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:				
Frederick	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	85	80	
	black cherry	---	---	
15C, 15D, 15E, 15F:				
Frederick	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	85	80	
	black cherry	---	---	
Carbo	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	
16C, 16D, 16E:				
Gilpin	northern red oak	70	52	northern red oak, eastern white pine, white oak, yellow-poplar
	black oak	65	47	
	red maple	80	62	
	white oak	65	47	
	yellow-poplar	85	80	
	hickory	---	---	

Table 8.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
17D, 17E, 17F:				
Gilpin	northern red oak	70	52	northern red oak, eastern white pine, white oak, yellow-poplar
	black oak	65	47	
	red maple	80	62	
	white oak	65	47	
	yellow-poplar	85	80	
	hickory	---	---	
Berks	northern red oak	65	47	northern red oak, black oak, white oak, eastern white pine
	black oak	60	43	
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
18A:				
Holly	American sycamore	---	---	swamp white oak, sweetgum
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	sweetgum	---	---	
19E:				
Itmann	black locust	---	---	eastern white pine
	Virginia pine	---	---	
	pitch pine	---	---	
20D:				
Jefferson	northern red oak	85	65	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	80	62	
	yellow-poplar	95	98	
21A:				
Lobdell	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
Orrville	black walnut	75	53	walnut, sweetgum
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
22C, 22E:				
Oriskany	northern red oak	75	57	northern red oak, eastern white pine, white ash, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white ash	---	---	
	white oak	75	57	
	yellow-poplar	95	98	
23A:				
Philo	yellow-poplar	90	90	walnut, yellow-poplar
	black walnut	75	53	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	

Table 8.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
24D, 24E:				
Pineville	northern red oak	85	65	northern red oak, black oak, eastern white pine, hickory, white ash, white oak, yellow-poplar
	black oak	85	65	
	hickory	---	---	
	yellow-poplar	110	123	
	white oak	---	---	
25. Pits				
26A:				
Pope	yellow-poplar	100	107	walnut, yellow-poplar
	black walnut	85	65	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
27D, 27E:				
Poplimento	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	90	90	
	black cherry	---	---	
Berks	northern red oak	65	47	northern red oak, black oak, white oak, eastern white pine
	black oak	60	43	
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
28B, 28C, 28D:				
Shottower	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
29B, 29C:				
Timberville	northern red oak	90	70	northern red oak, black walnut, eastern white pine, white ash, yellow-poplar
	white oak	85	65	
	red maple	---	---	
	sugar maple	65	41	
	yellow-poplar	95	98	
30C, 30D, 31C, 31D, 31E:				
Tumbling	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
32. Udorthents				
33. Urban land-Udorthents				

Table 8.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
34D, 34E:				
Wallen	chestnut oak	55	39	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	55	39	
	black oak	55	39	
	white oak	55	39	
	Virginia pine	---	---	
	pitch pine	---	---	
Alticrest	chestnut oak	55	39	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	55	39	
	black oak	55	39	
	white oak	55	39	
	Virginia pine	---	---	
	pitch pine	---	---	
35F:				
Wallen	chestnut oak	55	39	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	55	39	
	black oak	55	39	
	white oak	55	39	
	Virginia pine	---	---	
	pitch pine	---	---	
Rock outcrop.				
36C, 36D, 36E:				
Watahala	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	85	80	
	black cherry	---	---	
Frederick	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	75	57	
	yellow-poplar	85	80	
	black cherry	---	---	
W. Water				

Table 9.—Forestland Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
2D:							
Alticrest-----	70	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Restrictive layer	0.50				
Gilpin--------	25	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
3E:							
Beech Grove---	55	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Poplimento----	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
5D:							
Berks---------	55	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
Weikert-------	35	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
5E, 5F:							
Berks---------	55	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Weikert-------	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
6E:							
Bethesda------	60	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Fairpoint-----	20	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Sewell--------	15	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
7C:							
Carbo---------	80	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
7D:							
Carbo---------	75	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Stickiness/slope	0.50				
8C:							
Carbo---------	75	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Beech Grove---	20	Severe		Moderately suited		Severe	
		Restrictive layer	1.00	Slope	0.50	Low strength	1.00
				Low strength	0.50		
8D:							
Carbo---------	75	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Stickiness/slope	0.50				
Beech Grove---	20	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
8E:							
Carbo---------	60	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Beech Grove---	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
9C:							
Carbo---------	80	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Rock outcrop--	15	Not rated		Not rated		Not rated	

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D, 9E:							
Carbo	80	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Stickiness/slope	0.50				
Rock outcrop	15	Not rated		Not rated		Not rated	
10A:							
Chagrin	70	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Lobdell	25	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
11B:							
Escatawba	70	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Jefferson	25	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
11C:							
Escatawba	60	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Jefferson	35	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
12B:							
Frederick	95	Slight		Well suited		Moderate	
						Low strength	0.50
12C:							
Frederick	95	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
12D, 12E:							
Frederick	95	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
12F:							
Frederick	95	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50				
13B:							
Frederick	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
13C:							
Frederick	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
13D, 13E:							
Frederick-----	95	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
13F:							
Frederick-----	95	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
14B:							
Frederick-----	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
14C:							
Frederick-----	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
14D:							
Frederick-----	95	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
14E:							
Frederick-----	95	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
15C:							
Frederick-----	70	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Carbo---------	20	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
15D:							
Fredrick------	70	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Carbo---------	20	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Stickiness/slope	0.50				
15E:							
Frederick-----	65	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Carbo---------	30	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Stickiness/slope	0.50				

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
15F:							
Frederick-----	65	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Carbo---------	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
16C:							
Gilpin--------	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
16D:							
Gilpin--------	90	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
16E:							
Gilpin--------	90	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
17D:							
Gilpin--------	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Berks---------	15	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
17E:							
Gilpin--------	70	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Berks---------	25	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
17F:							
Gilpin--------	60	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Berks---------	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
18A:							
Holly---------	95	Severe		Poorly suited		Severe	
		Flooding	1.00	Ponding	1.00	Low strength	1.00
		Wetness	1.00	Flooding	1.00		
		Low strength	0.50	Wetness	0.50		

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
19E:							
Itmann--------	95	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
				Sandiness	0.50		
20D:							
Jefferson-----	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
21A:							
Lobdell-------	65	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Orrville------	30	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Wetness	0.50				
22C:							
Oriskany------	90	Moderate		Moderately suited		Severe	
		Stoniness	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Rock fragments	0.50		
				Low strength	0.50		
22E:							
Oriskany------	90	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Stoniness	0.50	Rock fragments	0.50		
		Low strength	0.50	Low strength	0.50		
23A:							
Philo---------	95	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
24D:							
Pineville-----	95	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
24E:							
Pineville-----	95	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50				
25:							
Pits----------	95	Not rated		Not rated		Not rated	
26A:							
Pope----------	95	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
27D:							
Poplimento----	60	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
27D:							
Berks----------	30	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
27E:							
Poplimento----	60	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Berks----------	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		
28B:							
Shottower-----	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
28C:							
Shottower-----	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
28D:							
Shottower-----	90	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
29B:							
Timberville---	90	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
29C:							
Timberville---	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
30C:							
Tumbling------	90	Slight		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
				Low strength	0.50		
30D:							
Tumbling------	90	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
31C:							
Tumbling------	90	Slight		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
				Low strength	0.50		
31D:							
Tumbling------	90	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
31E:							
Tumbling------	90	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
32:							
Udorthents----	85	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00		
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00		
34D:							
Wallen--------	55	Severe		Poorly suited		Moderate	
		Restrictive layer	1.00	Slope	1.00	Low strength	0.50
		Slope	0.50				
Alticrest-----	35	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Restrictive layer	0.50				
34E:							
Wallen--------	55	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
Alticrest-----	35	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
35F:							
Wallen--------	80	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
Frederick-----	20	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
36D:							
Watahala------	80	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Frederick-----	15	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
36E:							
Watahala------	80	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50				
Frederick-----	15	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50				

Table 9.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 9.—Forestland Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Slight		Slight		Moderately suited	
						Low strength	0.50
2D:							
Alticrest-----	70	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
Gilpin--------	25	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
3E:							
Beech Grove---	55	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E:							
Berks---------	60	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Poplimento----	30	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
4F:							
Berks---------	60	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
Poplimento----	30	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
5D:							
Berks---------	55	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Weikert-------	35	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
5E:							
Berks---------	55	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Weikert-------	35	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
5F:							
Berks---------	55	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
Weikert-------	35	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
6E:							
Bethesda------	60	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Fairpoint-----	20	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Sewell--------	15	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
7C:							
Carbo---------	80	Moderate		Slight		Moderately suited	
		Slope/erodibility	0.50			Slope	0.50
						Low strength	0.50
7D:							
Carbo---------	75	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
8C:							
Carbo---------	75	Moderate		Slight		Moderately suited	
		Slope/erodibility	0.50			Slope	0.50
						Low strength	0.50
Beech Grove---	20	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
8D:							
Carbo---------	75	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Beech Grove---	20	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
8E:							
Carbo---------	60	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Beech Grove---	30	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9C:							
Carbo----------	80	Moderate		Slight		Moderately suited	
		Slope/erodibility	0.50			Slope	0.50
						Low strength	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
9D:							
Carbo----------	80	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
9E:							
Carbo----------	80	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
10A:							
Chagrin-------	70	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
Lobdell-------	25	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
11B:							
Escatawba-----	70	Slight		Slight		Moderately suited	
						Low strength	0.50
Jefferson-----	25	Slight		Slight		Moderately suited	
						Low strength	0.50
11C:							
Escatawba-----	60	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
Jefferson-----	35	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
12B:							
Frederick-----	95	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
12C:							
Frederick-----	95	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
12D, 12E:							
Frederick-----	95	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
12F:							
Frederick-----	95	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
13B:							
Frederick-----	95	Slight		Slight		Moderately suited	
						Low strength	0.50
13C:							
Frederick-----	95	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
13D, 13E:							
Frederick-----	95	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
13F:							
Frederick-----	95	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
14B:							
Frederick-----	95	Slight		Slight		Moderately suited	
						Low strength	0.50
14C:							
Frederick-----	95	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
14D:							
Frederick-----	95	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
14E:							
Frederick-----	95	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
15C:							
Frederick-----	70	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
Carbo---------	20	Moderate		Slight		Moderately suited	
		Slope/erodibility	0.50			Slope	0.50
						Low strength	0.50
15D:							
Frederick-----	70	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Carbo---------	20	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
15E:							
Frederick-----	65	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Carbo---------	30	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
15F:							
Frederick-----	65	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Carbo---------	30	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
16C:							
Gilpin--------	90	Moderate		Slight		Moderately suited	
		Slope/erodibility	0.50			Slope	0.50
						Low strength	0.50
16D:							
Gilpin--------	90	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
16E:							
Gilpin--------	90	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
17D:							
Gilpin--------	80	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
Berks---------	15	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
17E:							
Gilpin--------	70	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
Berks---------	25	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
17F:							
Gilpin--------	60	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50
Berks---------	35	Very severe		Slight		Poorly suited	
		Slope/erodibility	0.95			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
18A:							
Holly----------	95	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Wetness	0.50
19E:							
Itmann---------	95	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
20D:							
Jefferson------	85	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
21A:							
Lobdell--------	65	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
Orrville-------	30	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
22C:							
Oriskany-------	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Rock fragments	0.50
						Low strength	0.50
22E:							
Oriskany-------	90	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Low strength	0.50
23A:							
Philo----------	95	Slight		Slight		Poorly suited	
						Flooding	1.00
24D:							
Pineville------	95	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
24E:							
Pineville------	95	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
25:							
Pits-----------	95	Not rated		Not rated		Not rated	
26A:							
Pope-----------	95	Slight		Slight		Poorly suited	
						Flooding	1.00
27D:							
Poplimento-----	60	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
27D:							
Berks----------	30	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
27E:							
Poplimento----	60	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
Berks----------	30	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
						Low strength	0.50
28B:							
Shottower-----	95	Slight		Slight		Moderately suited	
						Low strength	0.50
28C:							
Shottower-----	95	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
28D:							
Shottower-----	90	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
29B:							
Timberville---	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
29C:							
Timberville---	90	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
30C:							
Tumbling------	90	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
30D:							
Tumbling------	90	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50
31C:							
Tumbling------	90	Slight		Slight		Moderately suited	
						Slope	0.50
						Low strength	0.50
31D, 31E:							
Tumbling------	90	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
32:							
Udorthents----	85	Not rated		Not rated		Poorly suited	
						Slope	1.00
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Poorly suited	
						Slope	1.00
34D:							
Wallen--------	55	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Alticrest-----	35	Moderate		Slight		Poorly suited	
		Slope/erodibility	0.50			Slope	1.00
34E:							
Wallen--------	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
Alticrest-----	35	Severe		Slight		Poorly suited	
		Slope/erodibility	0.75			Slope	1.00
35F:							
Wallen--------	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
Frederick-----	20	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
36D:							
Watahala------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Frederick-----	15	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
36E:							
Watahala------	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
Frederick-----	15	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 9.—Forestland Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
1A:							
Allegheny	95	Well suited		Well suited		Moderately suited	
						Low strength	0.50
1B:							
Allegheny	95	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
2D:							
Alticrest	70	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
Gilpin	25	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
3E:							
Beech Grove	55	Unsuited		Unsuited		Poorly suited	
		Restrictive layer	1.00	Restrictive layer	1.00	Slope	1.00
		Slope	0.50	Slope	1.00	Low strength	0.50
Rock outcrop	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks	60	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
Poplimento	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
5D:							
Berks	55	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75	Slope	0.50
Weikert	35	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75	Slope	0.50
5E, 5F:							
Berks	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
Weikert	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
6E:							
Bethesda	60	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
6E:							
Fairpoint-----	20	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
				Rock fragments	0.50	Low strength	0.50
Sewell--------	15	Moderately suited		Unsuited		Moderately suited	
		Rock fragments	0.50	Rock fragments	1.00	Slope	0.50
		Slope	0.50	Slope	1.00		
7C:							
Carbo---------	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
7D:							
Carbo---------	75	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
						Slope	0.50
				Slope	0.75		
8C:							
Carbo---------	75	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
Beech Grove---	20	Unsuited		Unsuited		Moderately suited	
		Restrictive layer	1.00	Restrictive layer	1.00	Low strength	0.50
				Slope	0.50		
8D:							
Carbo---------	75	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
						Slope	0.50
				Slope	0.75		
Beech Grove---	20	Unsuited		Unsuited		Moderately suited	
		Restrictive layer	1.00	Restrictive layer	1.00	Low strength	0.50
				Slope	0.75	Slope	0.50
8E:							
Carbo---------	60	Poorly suited		Unsuited		Poorly suited	
		Stickiness; high plasticity index	0.75	Slope	1.00	Slope	1.00
				Stickiness; high plasticity index	0.75		
		Slope	0.50			Low strength	0.50
Beech Grove---	30	Unsuited		Unsuited		Poorly suited	
		Restrictive layer	1.00	Restrictive layer	1.00	Slope	1.00
		Slope	0.50	Slope	1.00	Low strength	0.50
9C:							
Carbo---------	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
Rock outcrop--	15	Not rated		Not rated		Not rated	

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
9D:							
Carbo----------	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.75	Slope	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
9E:							
Carbo----------	80	Poorly suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.75	Slope	1.00	Low strength	0.50
				Stickiness; high plasticity index	0.75	Slope	0.50
Rock outcrop--	15	Not rated		Not rated		Not rated	
10A:							
Chagrin--------	70	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Lobdell--------	25	Well suited		Well suited		Moderately suited	
						Low strength	0.50
11B:							
Escatawba------	70	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Jefferson------	25	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
11C:							
Escatawba------	60	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Jefferson------	35	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
12B, 12C:							
Frederick------	95	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Rock fragments	0.50		
				Slope	0.50		
				Stickiness; high plasticity index	0.50		
12D:							
Frederick------	95	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
12E:							
Frederick------	95	Moderately suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	1.00	Slope	0.50
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
12F:							
Frederick-----	95	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
13B, 13C:							
Frederick-----	95	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
13D:							
Frederick-----	95	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
13E:							
Frederick-----	95	Moderately suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	1.00	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
13F:							
Frederick-----	95	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
14B, 14C:							
Frederick-----	95	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
14D:							
Frederick-----	95	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
14E:							
Frederick-----	95	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
15C:							
Frederick-----	70	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
Carbo---------	20	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
15D:							
Frederick-----	70	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
Carbo---------	20	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.75	Slope	0.50
15E:							
Frederick-----	65	Moderately suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	1.00	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
Carbo---------	30	Poorly suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.75	Slope	1.00	Low strength	0.50
				Stickiness; high plasticity index	0.75	Slope	0.50
15F:							
Frederick-----	65	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
Carbo---------	30	Poorly suited		Unsuited		Poorly suited	
		Stickiness; high plasticity index	0.75	Slope	1.00	Slope	1.00
		Slope	0.50	Stickiness; high plasticity index	0.75	Low strength	0.50
16C:							
Gilpin--------	90	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
16D:							
Gilpin--------	90	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
16E:							
Gilpin--------	90	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
17D:							
Gilpin--------	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
Berks---------	15	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75	Slope	0.50
17E:							
Gilpin--------	70	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
17E:							
Berks---------	25	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
17F:							
Gilpin--------	60	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
Berks---------	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
18A:							
Holly---------	95	Well suited		Well suited		Poorly suited	
						Wetness	1.00
						Low strength	0.50
19E:							
Itmann--------	95	Moderately suited		Unsuited		Poorly suited	
		Sandiness	0.50	Rock fragments	1.00	Slope	1.00
		Rock fragments	0.50	Slope	1.00	Sandiness	0.50
		Slope	0.50	Sandiness	0.50		
20D:							
Jefferson-----	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
21A:							
Lobdell-------	65	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Orrville------	30	Well suited		Well suited		Moderately suited	
						Low strength	0.50
						Wetness	0.50
22C:							
Oriskany------	90	Moderately suited		Unsuited		Moderately suited	
		Rock fragments	0.50	Rock fragments	1.00	Rock fragments	0.50
				Slope	0.50	Low strength	0.50
22E:							
Oriskany------	90	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	1.00	Rock fragments	0.50
						Low strength	0.50
23A:							
Philo---------	95	Well suited		Well suited		Well suited	
24D:							
Pineville-----	95	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
24E:							
Pineville-----	95	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
25:							
Pits----------	95	Not rated		Not rated		Not rated	
26A:							
Pope----------	95	Well suited		Well suited		Well suited	
27D:							
Poplimento----	60	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
Berks---------	30	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75	Slope	0.50
27E:							
Poplimento----	60	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
Berks---------	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
28B, 28C:							
Shottower-----	95	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
28D:							
Shottower-----	90	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
29B, 29C:							
Timberville---	90	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
30C:							
Tumbling------	90	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Low strength	0.50
				Slope	0.50		
30D:							
Tumbling------	90	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
31C:							
Tumbling------	90	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Low strength	0.50
				Slope	0.50		

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
31D:							
Tumbling------	90	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
31E:							
Tumbling------	90	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
32:							
Udorthents----	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
34D:							
Wallen--------	55	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.75		
Alticrest-----	35	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
34E:							
Wallen--------	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75		
Alticrest-----	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
35F:							
Wallen--------	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75		
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Well suited		Moderately suited		Well suited	
				Rock fragments	0.50		
				Slope	0.50		
Frederick-----	20	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Slope	0.50		
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
36D:							
Watahala------	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		

Table 9.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
36D:							
Frederick-----	15	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
36E:							
Watahala------	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Frederick-----	15	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 9.—Forestland Management, Part IV

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
1A, 1B:					
Allegheny	95	Well suited		Well suited	
2D:					
Alticrest	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
Gilpin	25	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
3E:					
Beech Grove	55	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	35	Not rated		Not rated	
4E:					
Berks	60	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
Poplimento	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
4F:					
Berks	60	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Poplimento	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
5D:					
Berks	55	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
Weikert	35	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
5E:					
Berks	55	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
Weikert	35	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
5F:					
Berks	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Weikert	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
6E:					
Bethesda	60	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
Fairpoint	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Sewell	15	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
7C:					
Carbo	80	Poorly suited		Poorly suited	
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
7D:					
Carbo	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
8C:					
Carbo	75	Poorly suited		Poorly suited	
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
Beech Grove	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
8D:					
Carbo	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
Beech Grove	20	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	0.50	Slope	0.50
8E:					
Carbo	60	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
Beech Grove	30	Unsuited		Unsuited	
		Restrictive layer	1.00	Restrictive layer	1.00
		Slope	1.00	Slope	1.00

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
9C:					
Carbo	80	Poorly suited		Poorly suited	
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
Rock outcrop	15	Not rated		Not rated	
9D, 9E:					
Carbo	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Well suited		Well suited	
Lobdell	25	Well suited		Well suited	
11B:					
Escatawba	70	Well suited		Well suited	
Jefferson	25	Well suited		Well suited	
11C:					
Escatawba	60	Well suited		Well suited	
Jefferson	35	Well suited		Well suited	
12B, 12C:					
Frederick	95	Well suited		Well suited	
12D, 12E:					
Frederick	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
12F:					
Frederick	95	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
13B, 13C:					
Frederick	95	Well suited		Well suited	
13D, 13E:					
Frederick	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
13F:					
Frederick	95	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
14B, 14C:					
Frederick	95	Well suited		Well suited	
14D:					
Frederick	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
14E:					
Frederick	95	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
15C:					
Frederick	70	Well suited		Well suited	
Carbo	20	Poorly suited		Poorly suited	
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
15D:					
Frederick	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Carbo	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
15E:					
Frederick	65	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Carbo	30	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
15F:					
Frederick	65	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Carbo	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
16C:					
Gilpin	90	Well suited		Well suited	
16D:					
Gilpin	90	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
16E:					
Gilpin	90	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
17D:					
Gilpin	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Berks	15	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
17E:					
Gilpin	70	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Berks	25	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
17F:					
Gilpin	60	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Berks	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
18A:					
Holly	95	Well suited		Unsuited	
				Wetness	1.00
19E:					
Itmann	95	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
20D:					
Jefferson	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
21A:					
Lobdell	65	Well suited		Well suited	
Orrville	30	Well suited		Unsuited	
				Wetness	1.00
22C:					
Oriskany	90	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
22E:					
Oriskany	90	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
23A:					
Philo	95	Well suited		Well suited	
24D:					
Pineville	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
24E:					
Pineville	95	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Well suited		Well suited	

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
27D:					
Poplimento----------	60	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Berks---------------	30	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
27E:					
Poplimento----------	60	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Berks---------------	30	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
28B, 28C:					
Shottower-----------	95	Well suited		Well suited	
28D:					
Shottower-----------	90	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
29B, 29C:					
Timberville---------	90	Well suited		Well suited	
30C:					
Tumbling------------	90	Well suited		Well suited	
30D:					
Tumbling------------	90	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
31C:					
Tumbling------------	90	Well suited		Well suited	
31D, 31E:					
Tumbling------------	90	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
32:					
Udorthents----------	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
33:					
Urban land----------	70	Not rated		Not rated	
Udorthents----------	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
34D:					
Wallen--------------	55	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Restrictive layer	0.50
Alticrest-----------	35	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50

Table 9.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
34E:					
Wallen	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	0.50
Alticrest	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
35F:					
Wallen	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	0.50
Rock outcrop	15	Not rated		Not rated	
36C:					
Watahala	75	Well suited		Well suited	
Frederick	20	Well suited		Well suited	
36D:					
Watahala	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Frederick	15	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
36E:					
Watahala	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Frederick	15	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
W:					
Water	100	Not rated		Not rated	

Table 9.—Forestland Management, Part V

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
1A, 1B:					
Allegheny	95	Low		Low	
		Texture/rock fragments	0.10		
2D:					
Alticrest	70	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Gilpin	25	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
3E:					
Beech Grove	55	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Soil reaction	0.50
Rock outcrop	35	Not rated		Not rated	
4E, 4F:					
Berks	60	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Poplimento	30	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
5D:					
Berks	55	Moderate		Low	
		Texture/rock fragments	0.50		
Weikert	35	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
5E, 5F:					
Berks	55	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Weikert	35	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
6E:					
Bethesda	60	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Fairpoint	20	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Sewell	15	Moderate		Low	
		Texture/rock fragments	0.50		
7C:					
Carbo	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
7D:					
Carbo	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
8C:					
Carbo	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Beech Grove	20	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
				Soil reaction	0.50
8D:					
Carbo	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Beech Grove	20	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
8E:					
Carbo	60	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Beech Grove	30	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Soil reaction	0.50

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
9C, 9D:					
Carbo	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Rock outcrop	15	Not rated		Not rated	
9E:					
Carbo	80	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Low		Low	
		Texture/rock fragments	0.10		
Lobdell	25	Low		Low	
		Texture/rock fragments	0.10		
11B:					
Escatawba	70	Moderate		Low	
		Texture/rock fragments	0.50		
Jefferson	25	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
11C:					
Escatawba	60	Moderate		Low	
		Texture/rock fragments	0.50		
Jefferson	35	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
12B, 12C, 12D:					
Frederick	95	Moderate		Low	
		Texture/rock fragments	0.50		
12E, 12F:					
Frederick	95	Moderate		Low	
		Texture/slope/ rock fragments	0.50		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:					
Frederick----------	95	Moderate		Low	
		Texture/rock fragments	0.50		
15C, 15D:					
Frederick-----------	70	Moderate		Low	
		Texture/rock fragments	0.50		
Carbo---------------	20	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
15E, 15F:					
Frederick-----------	65	Moderate		Low	
		Texture/rock fragments	0.50		
Carbo---------------	30	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
16C, 16D:					
Gilpin--------------	90	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
16E:					
Gilpin--------------	90	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
17D:					
Gilpin--------------	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Berks---------------	15	Moderate		Low	
		Texture/rock fragments	0.50		
17E:					
Gilpin--------------	70	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Berks---------------	25	Moderate		Low	
		Texture/slope/ rock fragments	0.50		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
17F:					
Gilpin	60	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Berks	35	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
18A:					
Holly	95	Low		High	
		Texture/surface depth/rock fragments	0.10	Wetness	1.00
19E:					
Itmann	95	High		Low	
		Texture/rock fragments	1.00		
20D:					
Jefferson	85	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
21A:					
Lobdell	65	Low		Low	
		Texture/rock fragments	0.10		
Orrville	30	Low		Moderate	
		Texture/rock fragments	0.10	Wetness	0.50
22C:					
Oriskany	90	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
22E:					
Oriskany	90	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
23A:					
Philo	95	Low		Low	
		Texture/rock fragments	0.10		
24D:					
Pineville	95	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
24E:					
Pineville	95	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Low		Low	
		Texture/rock fragments	0.10		
27D:					
Poplimento	60	Moderate		Low	
		Texture/rock fragments	0.50		
Berks	30	Moderate		Low	
		Texture/rock fragments	0.50		
27E:					
Poplimento	60	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Berks	30	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
28B, 28C:					
Shottower	95	Moderate		Low	
		Texture/rock fragments	0.50		
28D:					
Shottower	90	Moderate		Low	
		Texture/rock fragments	0.50		
29B, 29C:					
Timberville	90	Low		Low	
		Texture/surface depth/rock fragments	0.10		
30C, 30D, 31C, 31D:					
Tumbling	90	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
31E:					
Tumbling	90	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
32:					
Udorthents	85	Not rated		Not rated	
33:					
Urban land	70	Not rated		Not rated	
Udorthents	20	Not rated		Not rated	
34D:					
Wallen	55	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Alticrest	35	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
34E:					
Wallen	55	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Alticrest	35	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
35F:					
Wallen	80	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Rock outcrop	15	Not rated		Not rated	
36C:					
Watahala	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Frederick	20	Moderate		Low	
		Texture/rock fragments	0.50		
36D:					
Watahala	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Frederick	15	Moderate		Low	
		Texture/rock fragments	0.50		

Table 9.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
36E:					
Watahala	80	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Frederick	15	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
W:					
Water	100	Not rated		Not rated	

Table 10.—Recreational Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A:							
Allegheny-----	95	Very limited		Not limited		Not limited	
		Flooding	1.00				
1B:							
Allegheny-----	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.88
2D:							
Alticrest-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.46
Gilpin--------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
Poplimento----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
5D, 5E, 5F:							
Berks---------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
Weikert-------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel content	0.56
6E:							
Bethesda------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Slow water movement	0.22	Slow water movement	0.22	Slope	1.00
		Gravel content	0.11	Gravel content	0.11	Slow water movement	0.22

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
6E:							
Fairpoint-----	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Slow water movement	0.22	Slow water movement	0.22	Slope	1.00
		Gravel content	0.01	Gravel content	0.01	Slow water movement	0.22
Sewell--------	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Large stones content	1.00
		Large stones content	0.76	Large stones content	0.76	Slope	1.00
						Large stones content	0.76
7C:							
Carbo---------	80	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.96
						Depth to bedrock	0.65
7D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65
8C:							
Carbo---------	75	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.96
						Depth to bedrock	0.65
Beech Grove---	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
						Gravel content	0.56
8D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65
Beech Grove---	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel content	0.56
8E:							
Carbo---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
8E:							
Beech Grove---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel content	0.56
9C:							
Carbo---------	80	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.96
						Depth to bedrock	0.65
Rock outcrop--	15	Not rated		Not rated		Not rated	
9D, 9E:							
Carbo---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65
Rock outcrop--	15	Not rated		Not rated		Not rated	
10A:							
Chagrin-------	70	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Lobdell-------	25	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
11B:							
Escatawba-----	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.88
						Slow water movement	0.26
Jefferson-----	25	Not limited		Not limited		Somewhat limited	
						Slope	0.88
11C:							
Escatawba-----	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
Jefferson-----	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
12B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.68	Gravel content	0.68	Gravel content	1.00
						Slope	0.88
12C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.68	Gravel content	0.68	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
12D, 12E, 12F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.68	Gravel content	0.68	Slope	1.00
13B:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Gravel content	0.56
13C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Gravel content	0.56
13D, 13E, 13F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
14B:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Gravel content	0.56
14C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Gravel content	0.56
14D, 14E:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
15C:							
Frederick-----	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Gravel content	0.56
Carbo---------	20	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.37	Slope	0.37	Slow water movement	0.96
						Depth to bedrock	0.65
15D:							
Frederick-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
Carbo---------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
15E, 15F:							
Frederick-----	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
Carbo---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.65
16C:							
Gilpin--------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.54
16D, 16E:							
Gilpin--------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
17D:							
Gilpin--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
Berks---------	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
17E:							
Gilpin--------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
Berks---------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
17F:							
Gilpin--------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
Berks---------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
18A:							
Holly---------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
19E:							
Itmann	95	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
20D:							
Jefferson	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76	Large stones content	0.76
21A:							
Lobdell	65	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
Orrville	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60
22C:							
Oriskany	90	Very limited		Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Large stones content	1.00
22E:							
Oriskany	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00	Large stones content	1.00
23A:							
Philo	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.60	Depth to saturated zone	0.90
		Depth to saturated zone	0.90	Too sandy	0.01	Flooding	0.60
		Too sandy	0.01			Too sandy	0.01
24D, 24E:							
Pineville	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76	Gravel content	0.99
						Large stones content	0.76
25:							
Pits	95	Not rated		Not rated		Not rated	
26A:							
Pope	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27D, 27E:							
Poplimento----	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
Berks---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.54
28B:							
Shottower-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
28C:							
Shottower-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
28D:							
Shottower-----	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
29B:							
Timberville---	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
						Slope	0.88
29C:							
Timberville---	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
30C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Gravel content	0.56
30D:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
31C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.94	Large stones content	0.94	Slope	1.00
		Slope	0.37	Slope	0.37	Large stones content	0.94
						Gravel content	0.56
31D, 31E:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Large stones content	0.94
						Gravel content	0.56
32:							
Udorthents----	85	Not rated		Not rated		Not rated	

Table 10.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Not rated	
34D, 34E:							
Wallen--------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Gravel content	1.00
		Gravel content	0.01	Gravel content	0.01	Large stones content	0.94
Alticrest-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Large stones content	0.94
						Depth to bedrock	0.46
35F:							
Wallen--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Gravel content	1.00
		Gravel content	0.01	Gravel content	0.01	Large stones content	0.94
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.68	Gravel content	0.68	Slope	1.00
		Slope	0.37	Slope	0.37	Gravel content	1.00
Frederick-----	20	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.68	Gravel content	0.68	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
36D, 36E:							
Watahala------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.68	Gravel content	0.68	Gravel content	1.00
Frederick-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.68	Gravel content	0.68	Slope	1.00
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 10.—Recreational Development, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Not limited		Not limited		Not limited	
2D:							
Alticrest-----	70	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.46
						Droughty	0.08
Gilpin--------	25	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.54
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
Poplimento----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
5D:							
Berks---------	55	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Droughty	0.97
Weikert-------	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
5E, 5F:							
Berks---------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
Weikert-------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
6E:							
Bethesda------	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
						Droughty	0.92
						Gravel content	0.11
Fairpoint-----	20	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
						Gravel content	0.01
						Large stones content	0.01
Sewell--------	15	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Large stones content	1.00
		Large stones content	0.76	Large stones content	0.76	Slope	1.00
7C:							
Carbo---------	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
						Slope	0.63
						Droughty	0.01
7D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.65
						Droughty	0.01
8C:							
Carbo---------	75	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
						Slope	0.63
						Droughty	0.01
Beech Grove---	20	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	0.63
8D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.65
						Droughty	0.01
Beech Grove---	20	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
8E:							
Carbo---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Depth to bedrock	0.65
						Droughty	0.01

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
8E:							
Beech Grove---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
9C:							
Carbo---------	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
						Slope	0.63
						Droughty	0.01
Rock outcrop--	15	Not rated		Not rated		Not rated	
9D:							
Carbo---------	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.65
						Droughty	0.01
Rock outcrop--	15	Not rated		Not rated		Not rated	
9E:							
Carbo---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.22	Depth to bedrock	0.65
						Droughty	0.01
Rock outcrop--	15	Not rated		Not rated		Not rated	
10A:							
Chagrin-------	70	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
Lobdell-------	25	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
11B:							
Escatawba-----	70	Not limited		Not limited		Not limited	
Jefferson-----	25	Not limited		Not limited		Not limited	
11C:							
Escatawba-----	60	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Jefferson-----	35	Not limited		Not limited		Somewhat limited	
						Slope	0.63
12B:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Gravel content	0.68
12C:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Gravel content	0.68
						Slope	0.37

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
12D:							
Frederick-----	95	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Gravel content	0.68
12E:							
Frederick-----	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
						Gravel content	0.68
12F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.68
13B:							
Frederick-----	95	Not limited		Not limited		Not limited	
13C:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.37
13D:							
Frederick-----	95	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
13E:							
Frederick-----	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
13F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
14B:							
Frederick-----	95	Not limited		Not limited		Not limited	
14C:							
Frederick-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.37
14D:							
Frederick-----	95	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
14E:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
15C:							
Frederick-----	70	Not limited		Not limited		Somewhat limited	
						Slope	0.37
Carbo---------	20	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
						Slope	0.37
						Droughty	0.01

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
15D:							
Frederick-----	70	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
Carbo---------	20	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.65
						Droughty	0.01
15E:							
Frederick-----	65	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
Carbo---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.22	Depth to bedrock	0.65
						Droughty	0.01
15F:							
Frederick-----	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Carbo---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Depth to bedrock	0.65
						Droughty	0.01
16C:							
Gilpin--------	90	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.54
16D:							
Gilpin--------	90	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.54
16E:							
Gilpin--------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
17D:							
Gilpin--------	80	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.54
Berks---------	15	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
17E:							
Gilpin--------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
Berks---------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
17F:							
Gilpin	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
Berks	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
18A:							
Holly	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
19E:							
Itmann	95	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
						Slope	1.00
20D:							
Jefferson	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.76	Slope	1.00
		Large stones content	0.76				
21A:							
Lobdell	65	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
Orrville	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
22C:							
Oriskany	90	Very limited		Very limited		Somewhat limited	
		Large stones content	1.00	Large stones content	1.00	Slope	0.63
						Large stones content	0.32
22E:							
Oriskany	90	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones content	1.00	Slope	1.00
		Large stones content	1.00	Slope	1.00	Large stones content	0.32
23A:							
Philo	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.22	Depth to saturated zone	0.22	Depth to saturated zone	0.60
		Too sandy	0.01	Too sandy	0.01	Flooding	0.60

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
24D:							
Pineville-----	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.76	Slope	1.00
		Large stones content	0.76			Droughty	0.04
						Large stones content	0.01
24E:							
Pineville-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76	Droughty	0.04
						Large stones content	0.01
25:							
Pits----------	95	Not rated		Not rated		Not rated	
26A:							
Pope----------	95	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
27D:							
Poplimento----	60	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
Berks---------	30	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
27E:							
Poplimento----	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Berks---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.97
						Depth to bedrock	0.54
28B:							
Shottower-----	95	Not limited		Not limited		Not limited	
28C:							
Shottower-----	95	Not limited		Not limited		Somewhat limited	
						Slope	0.63
28D:							
Shottower-----	90	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
29B:							
Timberville---	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
29C:							
Timberville---	90	Not limited		Not limited		Somewhat limited	
						Slope	0.37
30C:							
Tumbling------	90	Not limited		Not limited		Somewhat limited	
						Slope	0.37

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
30D:							
Tumbling------	90	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
31C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Large stones content	0.94	Large stones content	0.94	Slope	0.37
31D:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.94	Large stones content	0.94	Slope	1.00
		Slope	0.50				
31E:							
Tumbling------	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.94	Slope	1.00
		Large stones content	0.94	Slope	0.78		
32:							
Udorthents----	85	Not rated		Not rated		Not rated	
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Not rated	
34D:							
Wallen--------	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.94	Slope	1.00
		Large stones content	0.94			Droughty	0.89
						Depth to bedrock	0.80
Alticrest-----	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.94	Slope	1.00
		Large stones content	0.94			Depth to bedrock	0.46
						Droughty	0.08
34E:							
Wallen--------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Droughty	0.89
						Depth to bedrock	0.80
Alticrest-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Depth to bedrock	0.46
						Droughty	0.08
35F:							
Wallen--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.94	Large stones content	0.94	Droughty	0.89
						Depth to bedrock	0.80
Rock outcrop--	15	Not rated		Not rated		Not rated	

Table 10.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf fairways: Rating class and limiting features	Golf fairways: Value
36C:							
Watahala------	75	Not limited		Not limited		Somewhat limited	
						Gravel content	0.68
						Slope	0.37
Frederick-----	20	Not limited		Not limited		Somewhat limited	
						Gravel content	0.68
						Slope	0.37
36D:							
Watahala------	80	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Gravel content	0.68
Frederick-----	15	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Gravel content	0.68
36E:							
Watahala------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.68
Frederick-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.68
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 11.—Building Site Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A:							
Allegheny-----	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
1B:							
Allegheny-----	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
						Slope	0.12
2D:							
Alticrest-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
Gilpin--------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.54		
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
Poplimento----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
5D, 5E, 5F:							
Berks---------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
Weikert-------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
6E:							
Bethesda------	60	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Unstable fill	1.00	Unstable fill	1.00
		Slope	1.00	Slope	1.00	Slope	1.00

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
6E:							
Fairpoint	20	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Unstable fill	1.00	Unstable fill	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Sewell	15	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Unstable fill	1.00	Unstable fill	1.00
		Large stones content	1.00	Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
7C:							
Carbo	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	0.64
7D:							
Carbo	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
8C:							
Carbo	75	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	0.64
Beech Grove	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
8D:							
Carbo	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
Beech Grove	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
8E:							
Carbo	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
8E:							
Beech Grove---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
9C:							
Carbo---------	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	0.64
Rock outcrop--	15	Not rated		Not rated		Not rated	
9D, 9E:							
Carbo---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
Rock outcrop--	15	Not rated		Not rated		Not rated	
10A:							
Chagrin-------	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		
Lobdell-------	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
11B:							
Escatawba-----	70	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	0.99	Slope	0.12
Jefferson-----	25	Not limited		Not limited		Somewhat limited	
						Slope	0.12
11C:							
Escatawba-----	60	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	0.99	Slope	1.00
				Slope	0.63		
Jefferson-----	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
12B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
12C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
12D, 12E, 12F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
13B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
13C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
13D, 13E, 13F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
14B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
14C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
14D, 14E:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
15C:							
Frederick-----	70	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
Carbo---------	20	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.37	Slope	0.37	Depth to hard bedrock	0.64
15D:							
Frederick-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
15D:							
Carbo----------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
15E, 15F:							
Frederick------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Carbo----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
16C:							
Gilpin---------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.54		
16D, 16E:							
Gilpin---------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.54		
17D:							
Gilpin---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.54		
Berks----------	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
17E:							
Gilpin---------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.54		
Berks----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
17F:							
Gilpin---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.54		

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
17F:							
Berks	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
18A:							
Holly	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
19E:							
Itmann	95	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Unstable fill	1.00	Unstable fill	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
20D:							
Jefferson	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
21A:							
Lobdell	65	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
Orrville	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
22C:							
Oriskany	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Large stones content	0.50	Large stones content	0.50	Large stones content	0.50
22E:							
Oriskany	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.50	Large stones content	0.50	Large stones content	0.50
23A:							
Philo	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.90	Depth to saturated zone	1.00	Depth to saturated zone	0.90
24D, 24E:							
Pineville	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
25:							
Pits	95	Not rated		Not rated		Not rated	

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
26A:							
Pope----------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
27D, 27E:							
Poplimento----	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Berks---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
28B:							
Shottower-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
28C:							
Shottower-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
28D:							
Shottower-----	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
29B:							
Timberville---	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Shrink-swell	0.50	Slope	0.12
29C:							
Timberville---	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Shrink-swell	0.50	Slope	1.00
				Slope	0.37		
30C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
30D:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
31C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
31D, 31E:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
32:							
Udorthents----	85	Not rated		Not rated		Not rated	

Table 11.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
33:							
Urban land	70	Not rated		Not rated		Not rated	
Udorthents	20	Not rated		Not rated		Not rated	
34D, 34E:							
Wallen	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.79	Depth to hard bedrock	1.00	Depth to hard bedrock	0.79
Alticrest	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
35F:							
Wallen	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.79	Depth to hard bedrock	1.00	Depth to hard bedrock	0.79
Rock outcrop	15	Not rated		Not rated		Not rated	
36C:							
Watahala	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Frederick	20	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
36D, 36E:							
Watahala	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Frederick	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.—Building Site Development, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
		Flooding	0.40				
2D:							
Alticrest-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Cutbanks cave	1.00	Droughty	0.08
Gilpin--------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.54	Depth to bedrock	0.54
		Frost action	0.50	Cutbanks cave	0.10		
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Droughty	0.97
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.54
Poplimento----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Too clayey	0.12		
		Low strength	1.00	Cutbanks cave	0.10		
5D, 5E, 5F:							
Berks---------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Droughty	0.97
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.54
Weikert-------	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
6E:							
Bethesda------	60	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10	Droughty	0.92
		Frost action	0.50			Gravel content	0.11
Fairpoint-----	20	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10	Gravel content	0.01
		Shrink-swell	0.50			Large stones content	0.01
Sewell--------	15	Very limited		Very limited		Very limited	
		Unstable fill	1.00	Large stones content	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
7C:							
Carbo---------	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00	Too clayey	1.00	Slope	0.63
		Depth to hard bedrock	0.64	Slope	0.63	Droughty	0.01
7D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00	Slope	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00	Too clayey	1.00	Droughty	0.01
8C:							
Carbo---------	75	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00	Too clayey	1.00	Slope	0.63
		Depth to hard bedrock	0.64	Slope	0.63	Droughty	0.01
Beech Grove---	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.63
8D:							
Carbo---------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00	Slope	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00	Too clayey	1.00	Droughty	0.01
Beech Grove---	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
8E:							
Carbo	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00			Depth to bedrock	0.65
		Shrink-swell	1.00	Slope	1.00	Droughty	0.01
				Too clayey	1.00		
Beech Grove	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10		
9C:							
Carbo	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00		1.00	Slope	0.63
		Depth to hard bedrock	0.64	Too clayey	1.00	Droughty	0.01
				Slope	0.63		
Rock outcrop	15	Not rated		Not rated		Not rated	
9D, 9E:							
Carbo	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00			Depth to bedrock	0.65
		Shrink-swell	1.00	Slope	1.00	Droughty	0.01
				Too clayey	1.00		
Rock outcrop	15	Not rated		Not rated		Not rated	
10A:							
Chagrin	70	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Frost action	0.50				
				Flooding	0.60		
				Cutbanks cave	0.10		
Lobdell	25	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00			Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Flooding	0.60		
				Cutbanks cave	0.10		
11B:							
Escatawba	70	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Depth to saturated zone	0.99		
				Cutbanks cave	0.10		
Jefferson	25	Very limited		Very limited		Not limited	
		Low strength	1.00	Cutbanks cave	1.00		
		Frost action	0.50				
11C:							
Escatawba	60	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Depth to saturated zone	0.99	Slope	0.63
		Frost action	0.50				
				Slope	0.63		
				Cutbanks cave	0.10		

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
11C:							
Jefferson-----	35	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	1.00	Slope	0.63
		Slope	0.63	Slope	0.63		
		Frost action	0.50				
12B:							
Frederick-----	95	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Gravel content	0.68
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
12C:							
Frederick-----	95	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Gravel content	0.68
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		
12D, 12E, 12F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00	Gravel content	0.68
		Shrink-swell	0.50	Cutbanks cave	0.10		
13B:							
Frederick-----	95	Very limited		Very limited		Not limited	
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
13C:							
Frederick-----	95	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
		Frost action	0.50	Cutbanks cave	0.10		
13D, 13E, 13F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
14B:							
Frederick-----	95	Very limited		Very limited		Not limited	
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
14C:							
Frederick-----	95	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
		Frost action	0.50	Cutbanks cave	0.10		
14D, 14E:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
15C:							
Frederick-----	70	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
		Frost action	0.50	Cutbanks cave	0.10		
Carbo---------	20	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Shrink-swell	1.00			Slope	0.37
		Depth to hard bedrock	0.64	Too clayey	1.00	Droughty	0.01
				Slope	0.37		
15D:							
Frederick-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
Carbo---------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00			Depth to bedrock	0.65
		Shrink-swell	1.00	Slope	1.00	Droughty	0.01
				Too clayey	1.00		
15E, 15F:							
Frederick-----	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
Carbo---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00			Depth to bedrock	0.65
		Shrink-swell	1.00	Slope	1.00	Droughty	0.01
				Too clayey	1.00		
16C:							
Gilpin--------	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Depth to soft bedrock	0.54	Depth to bedrock	0.54
		Frost action	0.50				
				Cutbanks cave	0.10		
16D, 16E:							
Gilpin--------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.54	Depth to bedrock	0.54
		Frost action	0.50				
				Cutbanks cave	0.10		
17D:							
Gilpin--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.54	Depth to bedrock	0.54
		Frost action	0.50				
				Cutbanks cave	0.10		

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
17D:							
Berks	15	Very limited Slope Depth to hard bedrock Frost action	 1.00 0.54 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	 1.00 1.00 0.10	Very limited Slope Droughty Depth to bedrock	 1.00 0.97 0.54
17E:							
Gilpin	70	Very limited Slope Low strength Frost action	 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Cutbanks cave	 1.00 0.54 0.10	Very limited Slope Depth to bedrock	 1.00 0.54
Berks	25	Very limited Slope Depth to hard bedrock Frost action	 1.00 0.54 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	 1.00 1.00 0.10	Very limited Slope Droughty Depth to bedrock	 1.00 0.97 0.54
17F:							
Gilpin	60	Very limited Slope Low strength Frost action	 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Cutbanks cave	 1.00 0.54 0.10	Very limited Slope Depth to bedrock	 1.00 0.54
Berks	35	Very limited Slope Depth to hard bedrock Frost action	 1.00 0.54 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	 1.00 1.00 0.10	Very limited Slope Droughty Depth to bedrock	 1.00 0.97 0.54
18A:							
Holly	95	Very limited Ponding Depth to saturated zone Frost action	 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding	 1.00 1.00 0.80	Very limited Ponding Flooding Depth to saturated zone	 1.00 1.00 1.00
19E:							
Itmann	95	Very limited Unstable fill Slope Frost action	 1.00 1.00 0.50	Very limited Slope Cutbanks cave	 1.00 0.10	Very limited Gravel content Droughty Slope	 1.00 1.00 1.00
20D:							
Jefferson	85	Very limited Slope Low strength Frost action	 1.00 1.00 0.50	Very limited Slope Cutbanks cave	 1.00 1.00	Very limited Slope	 1.00
21A:							
Lobdell	65	Very limited Frost action Flooding Depth to saturated zone	 1.00 1.00 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	 0.60 0.19

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21A:							
Orrville------	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
22C:							
Oriskany------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Large stones content	0.50	Large stones content	0.50	Large stones content	0.32
		Frost action	0.50	Cutbanks cave	0.10		
22E:							
Oriskany------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.50	Large stones content	0.50	Large stones content	0.32
		Frost action	0.50	Cutbanks cave	0.10		
23A:							
Philo---------	95	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.60
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Depth to saturated zone	0.60	Cutbanks cave	0.10		
24D, 24E:							
Pineville-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.04
						Large stones content	0.01
25:							
Pits----------	95	Not rated		Not rated		Not rated	
26A:							
Pope----------	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		
27D, 27E:							
Poplimento----	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Too clayey	0.12		
		Low strength	1.00	Cutbanks cave	0.10		
Berks---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Droughty	0.97
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.54
28B:							
Shottower-----	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
28C:							
Shottower-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		
28D:							
Shottower-----	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		
29B:							
Timberville---	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Low strength	0.78	Cutbanks cave	0.10		
		Frost action	0.50				
29C:							
Timberville---	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.37				
30C:							
Tumbling------	90	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
				Too clayey	0.12		
30D:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00		
				Too clayey	0.12		
31C:							
Tumbling------	90	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
				Too clayey	0.12		
31D, 31E:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00		
				Too clayey	0.12		
32:							
Udorthents----	85	Not rated		Not rated		Not rated	
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Not rated	

Table 11.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
34D, 34E:							
Wallen--------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.79	Slope	1.00	Droughty	0.89
		Frost action	0.50	Cutbanks cave	1.00	Depth to bedrock	0.80
Alticrest-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Cutbanks cave	1.00	Droughty	0.08
35F:							
Wallen--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.79	Slope	1.00	Droughty	0.89
		Frost action	0.50	Cutbanks cave	1.00	Depth to bedrock	0.80
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	0.68
		Slope	0.37	Too clayey	0.88	Slope	0.37
				Slope	0.37		
Frederick-----	20	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Gravel content	0.68
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		
36D, 36E:							
Watahala------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	0.68
				Too clayey	0.88		
Frederick-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00	Gravel content	0.68
		Shrink-swell	0.50	Cutbanks cave	0.10		
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 12.—Sanitary Facilities, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1A:					
Allegheny	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
1B:					
Allegheny	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
		Flooding	0.40	Seepage	0.50
				Flooding	0.40
2D:					
Alticrest	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Gilpin	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
3E:					
Beech Grove	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	35	Not rated		Not rated	
4E, 4F:					
Berks	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Poplimento	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
5D, 5E, 5F:					
Berks	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
5D, 5E, 5F:					
Weikert	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
6E:					
Bethesda	60	Very limited		Very limited	
		Unstable fill	1.00	Slope	1.00
		Slow water movement	1.00		
		Slope	1.00		
Fairpoint	20	Very limited		Very limited	
		Unstable fill	1.00	Slope	1.00
		Slow water movement	1.00		
		Slope	1.00		
Sewell	15	Very limited		Very limited	
		Unstable fill	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
		Filtering capacity	1.00	Slope	1.00
7C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.63		
7D:					
Carbo	75	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
8C:					
Carbo	75	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.63		
Beech Grove	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Slope	1.00
8D:					
Carbo	75	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
8D:					
Beech Grove	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
8E:					
Carbo	60	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
Beech Grove	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
9C:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.63		
Rock outcrop	15	Not rated		Not rated	
9D, 9E:					
Carbo	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage	0.50
Lobdell	25	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
11B:					
Escatawba	70	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Slope	0.68
		Slow water movement	1.00	Seepage	0.50
				Depth to saturated zone	0.19
Jefferson	25	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
				Slope	0.68

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
11C:					
Escatawba-----------	60	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.50
		Slope	0.63	Depth to saturated zone	0.19
Jefferson-----------	35	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
12B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
12C:					
Frederick-----------	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
12D, 12E, 12F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
13B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
13C:					
Frederick-----------	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
13D, 13E, 13F:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
14B:					
Frederick-----------	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
14C:					
Frederick-----------	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
14D, 14E:					
Frederick-----------	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
15C:					
Frederick-----------	70	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Carbo---------------	20	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.37		
15D:					
Frederick-----------	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Carbo---------------	20	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
15E, 15F:					
Frederick-----------	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Carbo---------------	30	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
16C:					
Gilpin--------------	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
16D, 16E:					
Gilpin--------------	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
17D:					
Gilpin	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Berks	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
17E:					
Gilpin	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Berks	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
17F:					
Gilpin	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Berks	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
18A:					
Holly	95	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
19E:					
Itmann	95	Very limited		Very limited	
		Unstable fill	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00		
20D:					
Jefferson	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
21A:					
Lobdell	65	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
Orrville	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
22C:					
Oriskany	90	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
		Large stones content	0.50	Large stones content	0.99
22E:					
Oriskany	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	0.50	Large stones content	0.99
23A:					
Philo	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00
24D, 24E:					
Pineville	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
25:					
Pits	95	Not rated		Not rated	
26A:					
Pope	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage	1.00	Seepage	1.00
27D, 27E:					
Poplimento	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
Berks	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
28B:					
Shottower	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
28C:					
Shottower	95	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
28D:					
Shottower	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
29B:					
Timberville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
29C:					
Timberville	90	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
30C:					
Tumbling	90	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
30D:					
Tumbling	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
31C:					
Tumbling	90	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
31D, 31E:					
Tumbling	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
32:					
Udorthents	85	Not rated		Not rated	
33:					
Urban land	70	Not rated		Not rated	
Udorthents	20	Not rated		Not rated	

Table 12.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
34D, 34E:					
Wallen--------------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Alticrest-----------	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
35F:					
Wallen--------------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Rock outcrop--------	15	Not rated		Not rated	
36C:					
Watahala------------	75	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	1.00
Frederick-----------	20	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
36D, 36E:					
Watahala------------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
Frederick-----------	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
W:					
Water---------------	100	Not rated		Not rated	

Table 12.—Sanitary Facilities, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
2D:							
Alticrest-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.50
Gilpin--------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
Poplimento----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
5D, 5E, 5F:							
Berks---------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
Weikert-------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00			Gravel content	1.00
6E:							
Bethesda------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Too clayey	0.50			Slope	1.00
						Too clayey	0.50
Fairpoint-----	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.74

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
6E:							
Sewell	15	Very limited		Very limited		Very limited	
		Large stones content	1.00	Slope	1.00	Large stones content	1.00
		Slope	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00			Seepage	1.00
7C:							
Carbo	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
7D:							
Carbo	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
8C:							
Carbo	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
Beech Grove	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
8D:							
Carbo	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Beech Grove	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
8E:							
Carbo	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Beech Grove	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
9C:							
Carbo	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D, 9E:							
Carbo	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
10A:							
Chagrin	70	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Lobdell	25	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage	1.00				
11B:							
Escatawba	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.19	Depth to saturated zone	0.47
		Too clayey	0.50				
Jefferson	25	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
		Too clayey	0.50			Too clayey	0.50
11C:							
Escatawba	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Slope	0.63	Slope	0.63
		Slope	0.63	Depth to saturated zone	0.19	Depth to saturated zone	0.47
		Too clayey	0.50				
Jefferson	35	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.50
		Too clayey	0.50			Too clayey	0.50
12B:							
Frederick	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
12C:							
Frederick	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
12D, 12E, 12F:							
Frederick	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13B:							
Frederick-----	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
13C:							
Frederick-----	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
13D, 13E, 13F:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
14B:							
Frederick-----	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
14C:							
Frederick-----	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
14D, 14E:							
Frederick-----	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
15C:							
Frederick-----	70	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
Carbo---------	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
15D:							
Frederick-----	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Carbo---------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
15E, 15F:							
Frederick-----	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Carbo---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
16C:							
Gilpin--------	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
16D, 16E:							
Gilpin--------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
17D:							
Gilpin--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Berks---------	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
17E:							
Gilpin--------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Berks---------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
17F:							
Gilpin--------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Berks---------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
18A:							
Holly----------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Seepage	0.21
19E:							
Itmann---------	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Seepage	1.00	Seepage	1.00	Slope	1.00
						Seepage	1.00
20D:							
Jefferson------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Seepage	0.50
		Too clayey	0.50			Too clayey	0.50
21A:							
Lobdell--------	65	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage	1.00				
Orrville-------	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.21
		Seepage	1.00	Seepage	1.00		
22C:							
Oriskany-------	90	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Large stones content	0.57
		Large stones content	0.57			Seepage	0.50
22E:							
Oriskany-------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones content	0.57
		Large stones content	0.57			Seepage	0.50
23A:							
Philo----------	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.50
		Seepage	1.00	Seepage	1.00		
24D, 24E:							
Pineville------	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Seepage	0.50
		Too clayey	0.50			Too clayey	0.50
25:							
Pits-----------	95	Not rated		Not rated		Not rated	

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
26A:							
Pope----------	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.21
		Seepage	1.00	Seepage	1.00		
27D, 27E:							
Poplimento----	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Berks---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
28B:							
Shottower-----	95	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
28C:							
Shottower-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
28D:							
Shottower-----	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
29B:							
Timberville---	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Too clayey	0.50				
29C:							
Timberville---	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
30C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
30D:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
31C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
31D, 31E:							
Tumbling------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
32:							
Udorthents----	85	Not rated		Not rated		Not rated	

Table 12.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Not rated	
34D:							
Wallen--------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
Alticrest-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.50
34E:							
Wallen--------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
Alticrest-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Seepage	0.50
35F:							
Wallen--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	1.00
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Seepage	1.00	Gravel content	0.79
				Slope	0.37	Seepage	0.50
						Slope	0.37
Frederick-----	20	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
36D, 36E:							
Watahala------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Seepage	1.00	Gravel content	0.79
						Seepage	0.50
Frederick-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 13.—Construction Materials, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
1A, 1B:					
Allegheny-----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2D:					
Alticrest-----------	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.07
Gilpin--------------	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3E:					
Beech Grove---------	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop--------	35	Not rated		Not rated	
4E, 4F:					
Berks---------------	60	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
Poplimento----------	30	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
5D, 5E, 5F:					
Berks---------------	55	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
Weikert-------------	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.05	Thickest layer	0.00
6E:					
Bethesda------------	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
Fairpoint-----------	20	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Sewell--------------	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
7C:					
Carbo	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7D:					
Carbo	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8C, 8D:					
Carbo	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beech Grove	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8E:					
Carbo	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beech Grove	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9C, 9D, 9E:					
Carbo	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
10A:					
Chagrin	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Lobdell	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
11B:					
Escatawba	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jefferson	25	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
11C:					
Escatawba	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jefferson	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Table 13.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
12B, 12C, 12D, 12E, 12F, 13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:					
Frederick----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
15C, 15D:					
Frederick-----------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Carbo---------------	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
15E, 15F:					
Frederick-----------	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Carbo---------------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
16C, 16D, 16E:					
Gilpin--------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
17D:					
Gilpin--------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Berks---------------	15	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
17E:					
Gilpin--------------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Berks---------------	25	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
17F:					
Gilpin--------------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Berks---------------	35	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00

Table 13.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
18A:					
Holly----------------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
19E:					
Itmann--------------	95	Fair		Fair	
		Bottom layer	0.45	Bottom layer	0.04
		Thickest layer	0.45	Thickest layer	0.04
20D:					
Jefferson-----------	85	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
21A:					
Lobdell-------------	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Orrville------------	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
22C, 22E:					
Oriskany------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
23A:					
Philo---------------	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
24D, 24E:					
Pineville-----------	95	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
25:					
Pits----------------	95	Not rated		Not rated	
26A:					
Pope----------------	95	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.01
27D, 27E:					
Poplimento----------	60	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Berks---------------	30	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
28B, 28C:					
Shottower-----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
28D:					
Shottower	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
29B, 29C:					
Timberville	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
30C, 30D, 31C, 31D, 31E:					
Tumbling	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
32:					
Udorthents	85	Not rated		Not rated	
33:					
Urban land	70	Not rated		Not rated	
Udorthents	20	Not rated		Not rated	
34D, 34E:					
Wallen	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Alticrest	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.07
35F:					
Wallen	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
36C:					
Watahala	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Frederick	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
36D, 36E:					
Watahala	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Frederick	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
W:					
Water----------------	100	Not rated		Not rated	

Table 13.—Construction Materials, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Fair		Good		Fair	
		Organic matter content low	0.12			Too acid	0.59
		Too acid	0.50				
		Water erosion	0.99				
2D:							
Alticrest-----	70	Fair		Poor		Poor	
		Droughty	0.09	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Depth to bedrock	0.54
						Too acid	0.95
		Too acid	0.50				
Gilpin--------	25	Fair		Poor		Poor	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.00
				Slope	0.00	Depth to bedrock	0.46
		Depth to bedrock	0.46	Low strength	0.00	Too acid	0.99
		Droughty	0.47				
3E:							
Beech Grove---	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
						Rock fragments	0.68
Rock outcrop--	35	Not rated		Not rated		Not rated	
4E, 4F:							
Berks---------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
Poplimento----	30	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.17	Too acid	0.95
		Too acid	0.46				
5D, 5E, 5F:							
Berks---------	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
Weikert-------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.12			Depth to bedrock	0.00

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
6E:							
Bethesda------	60	Fair		Poor		Poor	
		Droughty	0.02	Slope	0.00	Hard to reclaim (dense layer)	0.00
		Organic matter content low	0.12			Rock fragments	0.00
		Too acid	0.50			Slope	0.00
Fairpoint-----	20	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
				Shrink-swell	0.87	Slope	0.00
						Hard to reclaim (rock fragments)	0.03
Sewell--------	15	Poor		Poor		Poor	
		Stone content	0.00	Stone content	0.00	Slope	0.00
		Organic matter content low	0.50	Slope	0.00	Rock fragments	0.50
		Too acid	0.50			Hard to reclaim (rock fragments)	0.76
7C:							
Carbo---------	80	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Depth to bedrock	0.35
				Shrink-swell	0.12	Slope	0.37
		Droughty	0.17				
7D:							
Carbo---------	75	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.12	Depth to bedrock	0.35
		Droughty	0.17				
8C:							
Carbo---------	75	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Depth to bedrock	0.35
				Shrink-swell	0.12	Slope	0.37
		Droughty	0.17				
Beech Grove---	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.37
						Rock fragments	0.68
8D:							
Carbo---------	75	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.12	Depth to bedrock	0.35
		Droughty	0.17				
Beech Grove---	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
						Rock fragments	0.68

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
8E:							
Carbo----------	60	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Too clayey	0.00
				Low strength	0.00	Depth to bedrock	0.35
		Droughty	0.17				
Beech Grove----	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
						Rock fragments	0.68
9C:							
Carbo----------	80	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Depth to bedrock	0.35
				Shrink-swell	0.12	Slope	0.37
		Droughty	0.17				
Rock outcrop---	15	Not rated		Not rated		Not rated	
9D:							
Carbo----------	80	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.12	Depth to bedrock	0.35
		Droughty	0.17				
Rock outcrop---	15	Not rated		Not rated		Not rated	
9E:							
Carbo----------	80	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Too clayey	0.00
				Low strength	0.00	Depth to bedrock	0.35
		Droughty	0.17				
Rock outcrop---	15	Not rated		Not rated		Not rated	
10A:							
Chagrin--------	70	Fair		Good		Good	
		Organic matter content low	0.50				
Lobdell--------	25	Fair		Fair		Fair	
		Organic matter content low	0.50	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Too acid	0.97				
		Water erosion	0.99				
11B:							
Escatawba------	70	Fair		Poor		Fair	
		Organic matter content low	0.12	Low strength	0.00	Too acid	0.76
				Depth to saturated zone	0.89	Depth to saturated zone	0.89
		Too acid	0.50				
		Water erosion	0.99				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
11B:							
Jefferson-----	25	Fair		Poor		Fair	
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.39
		Too acid	0.46			Hard to reclaim (rock fragments)	0.84
		Too clayey	0.68			Too acid	0.95
11C:							
Escatawba-----	60	Fair		Poor		Fair	
		Organic matter content low	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.50	Depth to saturated zone	0.89	Too acid	0.76
		Water erosion	0.99			Depth to saturated zone	0.89
Jefferson-----	35	Fair		Poor		Fair	
		Organic matter content low	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.46			Too clayey	0.39
		Too clayey	0.68			Hard to reclaim (rock fragments)	0.84
12B:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.12	Shrink-swell	0.87		
		Too acid	0.61				
12C:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.12	Shrink-swell	0.87	Slope	0.63
		Too acid	0.61				
12D:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.50	Too clayey	0.00
		Too acid	0.61	Shrink-swell	0.87		
12E, 12F:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
		Too acid	0.61	Shrink-swell	0.87		
13B:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.12	Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61			Too acid	0.99

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
13C:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.12	Shrink-swell	0.87	Slope	0.63
						Rock fragments	0.76
		Too acid	0.61				
13D:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter	0.12	Slope	0.50	Too clayey	0.00
		content low		Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
13E, 13F:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter	0.12	Low strength	0.00	Too clayey	0.00
		content low		Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
14B:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.87	Rock fragments	0.76
		content low				Too acid	0.99
		Too acid	0.61				
14C:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.87	Slope	0.63
		content low				Rock fragments	0.76
		Too acid	0.61				
14D:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter	0.12	Slope	0.50	Too clayey	0.00
		content low		Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
14E:							
Frederick-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter	0.12	Low strength	0.00	Too clayey	0.00
		content low		Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
15C:							
Frederick-----	70	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.87	Slope	0.63
		content low				Rock fragments	0.76
		Too acid	0.61				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
15C:							
Carbo----------	20	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Depth to bedrock	0.35
				Shrink-swell	0.12	Slope	0.63
		Droughty	0.17				
15D:							
Frederick------	70	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.50	Too clayey	0.00
				Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
Carbo----------	20	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.12	Depth to bedrock	0.35
		Droughty	0.17				
15E, 15F:							
Frederick------	65	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.87	Rock fragments	0.76
		Too acid	0.61				
Carbo----------	30	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Too clayey	0.00
				Low strength	0.00	Depth to bedrock	0.35
		Droughty	0.17				
16C:							
Gilpin---------	90	Fair		Poor		Fair	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.37
				Low strength	0.00	Depth to bedrock	0.46
		Depth to bedrock	0.46			Too acid	0.99
		Droughty	0.47				
16D, 16E:							
Gilpin---------	90	Fair		Poor		Poor	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.00
				Slope	0.00	Depth to bedrock	0.46
		Depth to bedrock	0.46	Low strength	0.00	Too acid	0.99
		Droughty	0.47				
17D:							
Gilpin---------	80	Fair		Poor		Poor	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.00
				Slope	0.00	Depth to bedrock	0.46
		Depth to bedrock	0.46	Low strength	0.00	Too acid	0.99
		Droughty	0.47				
Berks----------	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
17E:							
Gilpin	70	Fair		Poor		Poor	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.46	Slope	0.00	Depth to bedrock	0.46
		Droughty	0.47	Low strength	0.00	Too acid	0.99
Berks	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.46			Depth to bedrock	0.46
17F:							
Gilpin	60	Fair		Poor		Poor	
		Organic matter content low	0.12	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.46	Slope	0.00	Depth to bedrock	0.46
		Droughty	0.47	Low strength	0.00	Too acid	0.99
Berks	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.46			Depth to bedrock	0.46
18A:							
Holly	95	Fair		Poor		Poor	
		Organic matter content low	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.97				
		Water erosion	0.99				
19E:							
Itmann	95	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.12			Rock fragments	0.00
		Too acid	0.50			Slope	0.00
20D:							
Jefferson	85	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
		Too acid	0.46	Low strength	0.00	Too clayey	0.39
		Too clayey	0.68			Hard to reclaim (rock fragments)	0.84
21A:							
Lobdell	65	Fair		Fair		Fair	
		Organic matter content low	0.50	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Too acid	0.97				
		Water erosion	0.99				
Orrville	30	Fair		Poor		Poor	
		Organic matter content low	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.92				
		Water erosion	0.99				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
22C:							
Oriskany	90	Fair		Poor		Poor	
		Organic matter content low	0.12	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.43			Rock fragments	0.00
		Too acid	0.50			Slope	0.37
22E:							
Oriskany	90	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
				Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.43				
		Too acid	0.50			Rock fragments	0.00
23A:							
Philo	95	Fair		Fair		Fair	
		Too acid	0.50	Depth to saturated zone	0.22	Depth to saturated zone	0.22
		Organic matter content low	0.50			Too sandy	0.98
		Too sandy	0.98				
24D, 24E:							
Pineville	95	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
						Rock fragments	0.00
		Too acid	0.50			Hard to reclaim (rock fragments)	0.88
		Droughty	0.99				
25:							
Pits	95	Not rated		Not rated		Not rated	
26A:							
Pope	95	Fair		Good		Fair	
		Too acid	0.46			Too acid	0.95
		Organic matter content low	0.50				
27D:							
Poplimento	60	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Too clayey	0.00
				Shrink-swell	0.17	Too acid	0.95
		Too acid	0.46				
Berks	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
27E:							
Poplimento	60	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.17	Too acid	0.95
		Too acid	0.46				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
27E:							
Berks	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
28B:							
Shottower	95	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.87	Too clayey	0.00
		Organic matter content low	0.12				
		Too acid	0.84				
28C:							
Shottower	95	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.87	Too clayey	0.00
		Organic matter content low	0.12			Slope	0.37
		Too acid	0.84				
28D:							
Shottower	90	Poor		Fair		Poor	
		Too clayey	0.00	Slope	0.50	Slope	0.00
		Organic matter content low	0.12	Shrink-swell	0.87	Too clayey	0.00
		Too acid	0.84				
29B:							
Timberville	90	Fair		Fair		Good	
		Organic matter content low	0.12	Shrink-swell	0.99		
		Too acid	0.84				
		Water erosion	0.90				
29C:							
Timberville	90	Fair		Fair		Fair	
		Organic matter content low	0.12	Shrink-swell	0.99	Slope	0.63
		Too acid	0.84				
		Water erosion	0.90				
30C:							
Tumbling	90	Poor		Good		Poor	
		Too clayey	0.00			Too clayey	0.00
		Organic matter content low	0.12			Rock fragments	0.12
						Slope	0.63
		Too acid	0.50				
30D:							
Tumbling	90	Poor		Fair		Poor	
		Too clayey	0.00	Slope	0.50	Slope	0.00
		Organic matter content low	0.12			Too clayey	0.00
						Rock fragments	0.12
		Too acid	0.50				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
31C:							
Tumbling------	90	Poor		Good		Poor	
		Too clayey	0.00			Too clayey	0.00
		Organic matter content low	0.12			Rock fragments	0.12
						Slope	0.63
		Too acid	0.50				
31D:							
Tumbling------	90	Poor		Fair		Poor	
		Too clayey	0.00	Slope	0.50	Slope	0.00
		Organic matter content low	0.12			Too clayey	0.00
						Rock fragments	0.12
		Too acid	0.50				
31E:							
Tumbling------	90	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12			Too clayey	0.00
						Rock fragments	0.12
		Too acid	0.50				
32:							
Udorthents----	85	Not rated		Not rated		Not rated	
33:							
Urban land----	70	Not rated		Not rated		Not rated	
Udorthents----	20	Not rated		Not rated		Not rated	
34D, 34E:							
Wallen--------	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.00	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.21
		Depth to bedrock	0.21				
Alticrest-----	35	Fair		Poor		Poor	
		Droughty	0.09	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.12	Slope	0.00	Depth to bedrock	0.54
						Too acid	0.95
		Too acid	0.50				
35F:							
Wallen--------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.00	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.21
		Depth to bedrock	0.21				
Rock outcrop--	15	Not rated		Not rated		Not rated	
36C:							
Watahala------	75	Fair		Good		Poor	
		Organic matter content low	0.18			Rock fragments	0.00
						Too acid	0.50
		Too acid	0.50			Slope	0.63
		Droughty	0.66				

Table 13.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
36C:							
Frederick-----	20	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.12	Shrink-swell	0.87	Slope	0.63
		Too acid	0.61				
36D, 36E:							
Watahala------	80	Fair		Poor		Poor	
		Organic matter content low	0.18	Slope	0.00	Slope	0.00
						Rock fragments	0.00
		Too acid	0.50			Too acid	0.50
		Droughty	0.66				
Frederick-----	15	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.87		
		Too acid	0.61				
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 14.—Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1A, 1B:							
Allegheny-----	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	0.99	No wetness limitation	1.00
2D:							
Alticrest-----	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No wetness limitation	1.00
		Depth to bedrock	0.86	Seepage	0.07		
		Slope	0.28				
Gilpin--------	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.90	No wetness limitation	1.00
		Slope	0.28	Thin layer	0.88		
		Depth to bedrock	0.13				
3E:							
Beech Grove---	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Slope	0.97	Piping	1.00		
Rock outcrop--	35	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
4E:							
Berks---------	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	0.97	Seepage	0.35		
		Depth to bedrock	0.88				
Poplimento----	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Piping	0.03	No wetness limitation	1.00
		Seepage	0.03				
4F:							
Berks---------	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	1.00	Seepage	0.35		
		Depth to bedrock	0.88				
Poplimento----	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.03	No wetness limitation	1.00
		Seepage	0.03				
5D:							
Berks---------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Depth to bedrock	0.88	Seepage	0.35		
		Slope	0.28				
Weikert-------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Seepage	0.70	Seepage	0.05		
		Slope	0.28				

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
5E:							
Berks	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	0.97	Seepage	0.35		
		Depth to bedrock	0.88				
Weikert	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Slope	0.97	Seepage	0.05		
		Seepage	0.70				
5F:							
Berks	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	1.00	Seepage	0.35		
		Depth to bedrock	0.88				
Weikert	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No wetness limitation	1.00
		Depth to bedrock	1.00	Seepage	0.05		
		Seepage	0.70				
6E:							
Bethesda	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Seepage	0.12	No wetness limitation	1.00
		Seepage	0.04				
Fairpoint	20	Somewhat limited		Not limited		Very limited	
		Slope	0.72			No wetness limitation	1.00
		Seepage	0.04				
Sewell	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Large stones content	1.00	No wetness limitation	1.00
		Slope	0.72	Seepage	0.04		
7C:							
Carbo	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.01	Thin layer	0.91		
7D:							
Carbo	75	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.12	Thin layer	0.91		
8C:							
Carbo	75	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.01	Thin layer	0.91		
Beech Grove	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Slope	0.01	Piping	1.00		
8D:							
Carbo	75	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.12	Thin layer	0.91		

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
8D:							
Beech Grove---	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Slope	0.12	Piping	1.00		
8E:							
Carbo---------	60	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.88	Thin layer	0.91		
Beech Grove---	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No wetness limitation	1.00
		Slope	0.88	Piping	1.00		
9C:							
Carbo---------	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.01	Thin layer	0.91		
Rock outcrop--	15	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.01				
9D:							
Carbo---------	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.12	Thin layer	0.91		
Rock outcrop--	15	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.12				
9E:							
Carbo---------	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.50	Thin layer	0.91		
Rock outcrop--	15	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.50				
10A:							
Chagrin-------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Seepage	0.03	Depth to saturated zone	0.81
						Slow refill	0.30
						Cutbanks cave	0.10
Lobdell-------	25	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Cutbanks cave	0.10
				Depth to saturated zone	0.99	Depth to saturated zone	0.01
11B:							
Escatawba-----	70	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.93	No wetness limitation	1.00
				Depth to saturated zone	0.86		

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
11B:							
Jefferson-----	25	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.91	No wetness limitation	1.00
11C:							
Escatawba-----	60	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.93	No wetness limitation	1.00
		Slope	0.01	Depth to saturated zone	0.86		
Jefferson-----	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.91	No wetness limitation	1.00
		Slope	0.01				
12B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
12C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
		Slope	0.01				
12D:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
		Slope	0.12				
12E:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
		Slope	0.50				
12F:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.09	No wetness limitation	1.00
		Seepage	0.70				
13B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
13C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.01				
13D:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.12				
13E:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.50				

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
13F:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.10	No wetness limitation	1.00
		Seepage	0.70				
14B:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
14C:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.01				
14D:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.12				
14E:							
Frederick-----	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.10	No wetness limitation	1.00
		Seepage	0.70				
15C:							
Frederick-----	70	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.01				
Carbo---------	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.01	Thin layer	0.91		
15D:							
Frederick-----	70	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.12				
Carbo---------	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.12	Thin layer	0.91		
15E:							
Frederick-----	65	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.10	No wetness limitation	1.00
		Slope	0.50				
Carbo---------	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.91	Hard to pack	0.99	No wetness limitation	1.00
		Slope	0.50	Thin layer	0.91		
15F:							
Frederick-----	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.10	No wetness limitation	1.00
		Seepage	0.70				
Carbo---------	30	Somewhat limited		Very limited		Very limited	
		Slope	0.97	Hard to pack	0.99	No wetness limitation	1.00
		Depth to bedrock	0.91	Thin layer	0.91		

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
16C:							
Gilpin--------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.90	No wetness limitation	1.00
		Depth to bedrock	0.13	Thin layer	0.88		
		Slope	0.01				
16D:							
Gilpin--------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.90	No wetness limitation	1.00
		Slope	0.28	Thin layer	0.88		
		Depth to bedrock	0.13				
16E:							
Gilpin--------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Piping	0.90	No wetness limitation	1.00
		Seepage	0.70	Thin layer	0.88		
		Depth to bedrock	0.13				
17D:							
Gilpin--------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.90	No wetness limitation	1.00
		Slope	0.28	Thin layer	0.88		
		Depth to bedrock	0.13				
Berks---------	15	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Depth to bedrock	0.88	Seepage	0.35		
		Slope	0.28				
17E:							
Gilpin--------	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Piping	0.90	No wetness limitation	1.00
		Seepage	0.70	Thin layer	0.88		
		Depth to bedrock	0.13				
Berks---------	25	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	0.97	Seepage	0.35		
		Depth to bedrock	0.88				
17F:							
Gilpin--------	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.90	No wetness limitation	1.00
		Seepage	0.70	Thin layer	0.88		
		Depth to bedrock	0.13				
Berks---------	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	1.00	Seepage	0.35		
		Depth to bedrock	0.88				
18A:							
Holly---------	95	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	0.10
				Depth to saturated zone	1.00		
				Piping	0.98		

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
19E:							
Itmann--------	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.45	No wetness limitation	1.00
		Slope	0.88				
20D:							
Jefferson-----	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.91	No wetness limitation	1.00
		Slope	0.28				
21A:							
Lobdell-------	65	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Cutbanks cave	0.10
				Depth to saturated zone	0.99	Depth to saturated zone	0.01
Orrville------	30	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	1.00		
				Seepage	0.03		
22C:							
Oriskany------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No wetness limitation	1.00
		Slope	0.01	Large stones content	0.50		
22E:							
Oriskany------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No wetness limitation	1.00
		Slope	0.97	Large stones content	0.50		
23A:							
Philo---------	95	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Seepage	0.02		
24D:							
Pineville-----	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.85	No wetness limitation	1.00
		Slope	0.28				
24E:							
Pineville-----	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.85	No wetness limitation	1.00
		Slope	0.97				
25:							
Pits----------	95	Somewhat limited		Not rated		Not rated	
		Slope	0.28				
26A:							
Pope----------	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.01	No wetness limitation	1.00

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27D:							
Poplimento----	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.28	Piping	0.03	No wetness limitation	1.00
		Seepage	0.03				
Berks---------	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Depth to bedrock	0.88	Seepage	0.35		
		Slope	0.28				
27E:							
Poplimento----	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Piping	0.03	No wetness limitation	1.00
		Seepage	0.03				
Berks---------	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No wetness limitation	1.00
		Slope	0.97	Seepage	0.35		
		Depth to bedrock	0.88				
28B:							
Shottower-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.30	No wetness limitation	1.00
28C:							
Shottower-----	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.30	No wetness limitation	1.00
		Slope	0.01				
28D:							
Shottower-----	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.30	No wetness limitation	1.00
		Slope	0.12				
29B:							
Timberville---	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.74	No wetness limitation	1.00
29C:							
Timberville---	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.74	No wetness limitation	1.00
		Slope	0.01				
30C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.40	No wetness limitation	1.00
		Slope	0.01				
30D:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.40	No wetness limitation	1.00
		Slope	0.12				
31C:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.40	No wetness limitation	1.00
		Slope	0.01				

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
31D:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.40	No wetness limitation	1.00
		Slope	0.12				
31E:							
Tumbling------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Piping	0.40	No wetness limitation	1.00
		Seepage	0.70				
32:							
Udorthents----	85	Somewhat limited		Not rated		Not rated	
		Slope	0.28				
33:							
Urban land----	70	Somewhat limited		Not rated		Not rated	
		Slope	0.28				
Udorthents----	20	Somewhat limited		Not rated		Not rated	
		Slope	0.28				
34D:							
Wallen--------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.95	No wetness limitation	1.00
		Depth to bedrock	0.95				
		Slope	0.28				
Alticrest-----	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No wetness limitation	1.00
		Depth to bedrock	0.86	Seepage	0.07		
		Slope	0.28				
34E:							
Wallen--------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.95	No wetness limitation	1.00
		Slope	0.97				
		Depth to bedrock	0.95				
Alticrest-----	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No wetness limitation	1.00
		Slope	0.97	Seepage	0.07		
		Depth to bedrock	0.86				
35F:							
Wallen--------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.95	No wetness limitation	1.00
		Slope	0.97				
		Depth to bedrock	0.95				
Rock outcrop--	15	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
36C:							
Watahala------	75	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	No wetness limitation	1.00
		Slope	0.01				

Table 14.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
36C:							
Frederick-----	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
		Slope	0.01				
36D:							
Watahala------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	No wetness limitation	1.00
		Slope	0.28				
Frederick-----	15	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.09	No wetness limitation	1.00
		Slope	0.28				
36E:							
Watahala------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	No wetness limitation	1.00
		Slope	0.97				
Frederick-----	15	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.09	No wetness limitation	1.00
		Seepage	0.70				
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 15.—Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
1A, 1B:												
Allegheny-------	0-5	Loam	CL, CL-ML	A-4	0	0-8	85-100	80-100	70-95	50-75	21-31	6-11
	5-30	Clay loam, silty clay loam, gravelly sandy clay loam, loam	CL, SC	A-6, A-2-4	0	0-7	70-100	60-100	50-100	20-95	23-39	7-16
	30-62	Loam, clay loam, gravelly fine sandy loam	CL, CL-ML, ML, SM, SC, SC-SM	A-4, A-1, A-6, A-2-4	0	0-7	65-100	50-100	35-100	20-80	16-39	3-16
2D:												
Alticrest-------	0-3	Fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0	85-100	75-100	55-85	30-55	14-22	2-7
	3-27	Sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	85-100	75-100	45-95	25-75	14-23	2-7
	27-30	Loamy sand, sandy loam, sand	SM, SP-SM	A-4, A-1, A-2-4	0	0	85-100	75-100	40-75	5-40	10-16	NP-3
	30-40	Bedrock			---	---	---	---	---	---	---	---
Gilpin----------	0-2	Silt loam	CL, CL-ML	A-4	0	0-2	80-95	75-95	70-90	55-80	21-31	6-11
	2-5	Silt loam, very channery loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0-5	60-95	45-90	40-90	30-80	23-39	7-16
	5-29	Silty clay loam, very channery loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-5	60-95	45-90	40-90	30-85	23-39	7-16
	29-39	Bedrock			---	---	---	---	---	---	---	---
3E:												
Beech Grove-----	0-3	Silt loam, channery silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-10	60-100	50-100	45-100	35-90	21-36	4-16
	3-13	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4E, 4F:												
Berks-----------	0-5	Silt loam	CL-ML, CL, ML	A-4	0	0-2	80-85	75-80	70-80	55-75	12-28	1-10
	5-16	Very channery silt loam, extremely channery loam, channery silty clay loam	SC, SM, SC-SM, CL, CL-ML, ML, GC-GM, GC, GM	A-2-4, A-4, A-6, A-1	0	0-10	35-80	15-75	15-75	10-70	12-36	1-14
	16-29	Extremely channery silt loam, very channery silt loam, extremely channery loam	GC-GM, GC, GM, SM, SC, SC-SM	A-2-4, A-1, A-4	0	0-10	30-60	5-45	5-45	5-40	12-25	1-8
	29-39	Bedrock			---	---	---	---	---	---	---	---
Poplimento------	0-8	Silt loam	CL, CL-ML	A-4	0	0-2	80-100	75-100	65-100	50-90	22-31	6-11
	8-15	Silty clay loam, clay, loam	CL, CH, MH, ML	A-7, A-4	0	0-2	80-100	75-100	65-100	45-95	25-61	8-28
	15-55	Clay, silty clay, silty clay loam	CL, CH, MH, ML	A-7	0	0-5	80-100	75-100	70-100	60-95	39-57	16-26
	55-62	Silty clay, clay, very channery silty clay loam	CL, GC	A-7, A-2-6	0	0-5	45-100	30-100	30-100	25-95	31-52	11-23
5D, 5E, 5F:												
Berks-----------	0-5	Silt loam	CL-ML, CL, ML	A-4	0	0-2	80-85	75-80	70-80	55-75	12-28	1-10
	5-16	Very channery silt loam, extremely channery loam, channery silty clay loam	SC, SM, SC-SM, CL, CL-ML, ML, GC-GM, GC, GM	A-2-4, A-4, A-6, A-1	0	0-10	35-80	15-75	15-75	10-70	12-36	1-14
	16-29	Extremely channery silt loam, very channery silt loam, extremely channery loam	GC-GM, GC, GM, SM, SC, SC-SM	A-2-4, A-1, A-4	0	0-10	30-60	5-45	5-45	5-40	12-25	1-8
	29-39	Bedrock			---	---	---	---	---	---	---	---

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5D, 5E, 5F:												
Weikert---------	0-3	Silt loam	CL, CL-ML, ML	A-4	0	0-2	80-95	75-90	70-90	55-80	12-30	1-11
	3-15	Very channery silt loam, very channery loam	GC, GC-GM, GM, SM, SC, SC-SM	A-2-4, A-4, A-1	0	0-10	45-60	25-45	20-45	15-40	12-31	1-11
	15-25	Bedrock			---	---	---	---	---	---	---	---
6E:												
Bethesda--------	0-7	Gravelly silt loam	CL, CL-ML, SC, SC-SM	A-4	0	0-1	60-80	50-75	45-75	35-70	23-31	7-11
	7-62	Extremely channery silty clay loam, channery silty clay loam, extremely channery loam, very channery silt loam	GC, GC-GM, CL, CL-ML, SC, SC-SM	A-2-6, A-2-4, A-6	0-15	0-15	40-85	20-80	15-80	15-75	23-39	7-16
Fairpoint-------	0-5	Channery silt loam	CL, CL-ML, SC, SC-SM	A-4	0	2-10	65-85	60-75	50-75	40-70	23-31	7-11
	5-62	Very channery silt loam, very channery silty clay loam, extremely channery loam	SC, SC-SM, GC, GC-GM	A-6, A-2-6, A-2-4	0	10-20	35-70	20-60	15-60	10-55	23-39	7-16
Sewell----------	0-10	Stony sandy loam	SC-SM, SM	A-2-4, A-4	15-30	7-15	95-100	90-100	55-70	25-40	12-23	1-7
	10-62	Very stony sandy loam, very stony loam, extremely stony loamy sand	SM, SC-SM, ML, CL-ML	A-2-4, A-1, A-4	35-55	7-15	60-90	45-85	20-80	5-65	12-23	1-7

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
7C, 7D:												
Carbo-----------	0-3	Silt loam	CL	A-6	0	0-3	85-100	85-100	75-100	60-90	30-36	11-16
	3-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0-3	80-100	80-100	70-100	55-95	30-48	11-25
	8-28	Clay	CH	A-7	0	0-3	80-100	80-100	70-100	55-95	66-84	39-53
	28-38	Bedrock			---	---	---	---	---	---	---	---
8C, 8D, 8E:												
Carbo-----------	0-3	Silt loam	CL	A-6	0	0-3	85-100	85-100	75-100	60-90	30-36	11-16
	3-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0-3	80-100	80-100	70-100	55-95	30-48	11-25
	8-28	Clay	CH	A-7	0	0-3	80-100	80-100	70-100	55-95	66-84	39-53
	28-38	Bedrock			---	---	---	---	---	---	---	---
Beech Grove-----	0-3	Silt loam, channery silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-10	60-100	50-100	45-100	35-90	21-36	4-16
	3-13	Bedrock			---	---	---	---	---	---	---	---
9C, 9D, 9E:												
Carbo-----------	0-3	Silt loam	CL	A-6	0	0-3	85-100	85-100	75-100	60-90	30-36	11-16
	3-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0-3	80-100	80-100	70-100	55-95	30-48	11-25
	8-28	Clay	CH	A-7	0	0-3	80-100	80-100	70-100	55-95	66-84	39-53
	28-38	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												
10A:												
Chagrin---------	0-6	Loam	CL-ML, SC, SC-SM, CL, ML	A-4	0	0-3	85-100	80-100	65-95	45-75	16-30	3-11
	6-42	Sandy clay loam, loam, silt loam, silty clay loam	SC, SC-SM, CL, CL-ML	A-6, A-2-4	0	0-3	85-100	80-100	65-100	30-95	23-39	7-16
	42-62	Sandy loam, loam, silt loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4	0	0-3	85-100	80-100	45-100	25-90	12-30	1-11
Lobdell---------	0-8	Silt loam	CL, CL-ML	A-4	0	0-1	95-100	90-100	80-100	65-90	21-31	6-11
	8-48	Loam, silt loam	CL, SC	A-4	0	0-3	85-100	75-100	65-100	45-90	23-31	7-11
	48-62	Loam, silt loam	CL, SC	A-4	0	0-3	85-100	75-100	65-100	45-90	23-31	7-11

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
11B, 11C:												
Escatawba-------	0-5	Loam	CL, CL-ML, ML	A-4	0	0-8	85-100	80-100	70-95	50-75	14-25	2-8
	5-17	Loam, silt loam, fine sandy loam	CL, CL-ML, ML, SM, SC, SC-SM	A-4	0	0-8	85-100	80-100	55-100	35-90	14-25	2-8
	17-38	Loam, silt loam, cobbly loam	CL, SC	A-4	0	0-21	75-100	65-100	55-100	40-90	23-31	7-11
	38-62	Clay loam, clay, very cobbly clay loam	CL, SC	A-7	0	0-25	60-90	60-85	45-85	35-80	39-52	16-23
Jefferson-------	0-4	Loam	CL-ML, CL, ML	A-4	0	0	80-95	75-95	65-90	45-70	16-30	3-11
	4-11	Loam, silt loam, gravelly sandy loam	CL-ML, CL, ML, SM, SC, SC-SM	A-4, A-2-4, A-1	0	0	65-95	55-90	30-90	15-80	16-30	3-11
	11-42	Clay loam, loam, gravelly sandy loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-13	70-95	60-90	35-90	20-70	23-39	7-16
	42-62	Gravelly clay loam, extremely gravelly sandy loam	SC, SC-SM, GP-GC, GC, GC-GM	A-6, A-2-4	0	0-11	35-75	15-70	10-65	5-55	21-34	6-13
12B, 12C, 12D, 12E, 12F:												
Frederick------	0-8	Gravelly loam	SC, SM, SC-SM	A-4, A-2-4	0	0	60-80	50-75	45-70	30-55	13-31	1-11
	8-24	Clay, silty clay loam, gravelly clay loam	CH, CL, MH, ML, SM, SC	A-7	0	0	60-100	50-100	45-100	35-95	39-61	16-28
	24-62	Clay, silty clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-75	18-36

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:												
Frederick------	0-9	Silt loam	CL, CL-ML, ML	A-4	0	0	80-100	75-100	70-100	50-90	13-31	1-11
	9-21	Clay, silty clay loam, gravelly clay loam	CH, CL, MH, ML, SM, SC	A-7	0	0	60-100	50-100	45-100	35-95	39-61	16-28
	21-62	Clay, silty clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-75	18-36
15C, 15D, 15E, 15F:												
Frederick------	0-9	Silt loam	CL, CL-ML, ML	A-4	0	0	80-100	75-100	70-100	50-90	13-31	1-11
	9-21	Clay, silty clay loam, gravelly clay loam	CH, CL, MH, ML, SM, SC	A-7	0	0	60-100	50-100	45-100	35-95	39-61	16-28
	21-62	Clay, silty clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-75	18-36
Carbo----------	0-3	Silt loam	CL	A-6	0	0-3	85-100	85-100	75-100	60-90	30-36	11-16
	3-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0-3	80-100	80-100	70-100	55-95	30-48	11-25
	8-28	Clay	CH	A-7	0	0-3	80-100	80-100	70-100	55-95	66-84	39-53
	28-38	Bedrock			---	---	---	---	---	---	---	---
16C, 16D, 16E:												
Gilpin----------	0-2	Silt loam	CL, CL-ML	A-4	0	0-2	80-95	75-95	70-90	55-80	21-31	6-11
	2-5	Silt loam, very channery loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0-5	60-95	45-90	40-90	30-80	23-39	7-16
	5-29	Silty clay loam, very channery loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-5	60-95	45-90	40-90	30-85	23-39	7-16
	29-39	Bedrock			---	---	---	---	---	---	---	---

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
17D, 17E, 17F:												
Gilpin----------	0-2	Silt loam	CL, CL-ML	A-4	0	0-2	80-95	75-95	70-90	55-80	21-31	6-11
	2-5	Silt loam, very channery loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0-5	60-95	45-90	40-90	30-80	23-39	7-16
	5-29	Silty clay loam, very channery loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-5	60-95	45-90	40-90	30-85	23-39	7-16
	29-39	Bedrock			---	---	---	---	---	---	---	---
Berks-----------	0-5	Silt loam	CL-ML, CL, ML	A-4	0	0-2	80-85	75-80	70-80	55-75	12-28	1-10
	5-16	Very channery silt loam, extremely channery loam, channery silty clay loam	SC, SM, SC-SM, CL, CL-ML, ML, GC-GM, GC, GM	A-2-4, A-4, A-6, A-1	0	0-10	35-80	15-75	15-75	10-70	12-36	1-14
	16-29	Extremely channery silt loam, very channery silt loam, extremely channery loam	GC-GM, GC, GM, SM, SC, SC-SM	A-2-4, A-1, A-4	0	0-10	30-60	5-45	5-45	5-40	12-25	1-8
	29-39	Bedrock			---	---	---	---	---	---	---	---
18A:												
Holly-----------	0-4	Loam	CL, CL-ML	A-4	0	0	90-100	85-100	70-95	50-75	21-31	6-11
	4-34	Loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	80-100	75-100	65-100	45-95	23-39	7-16
	34-62	Loam, silty clay loam, gravelly sand	CL, ML, CL-ML, SC, SP-SC, SC-SM	A-4, A-2-4, A-1	0	0-8	75-100	65-100	35-100	5-95	12-43	1-18
19E:												
Itmann----------	0-62	Extremely channery sandy loam, very channery loam, extremely channery loamy sand	GM, GC-GM	A-1, A-2-4	0	0-10	30-55	10-40	5-40	2-30	11-21	NP-6

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
20D:												
Jefferson-------	0-4	Loam	CL-ML, CL, ML	A-4	0	0	80-95	75-95	65-90	45-70	16-30	3-11
	4-11	Loam, silt loam, gravelly sandy loam	CL-ML, CL, ML, SM, SC, SC-SM	A-4, A-2-4, A-1	0	0	65-95	55-90	30-90	15-80	16-30	3-11
	11-42	Clay loam, loam, gravelly sandy loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-13	70-95	60-90	35-90	20-70	23-39	7-16
	42-62	Gravelly clay loam, extremely gravelly sandy loam	SC, SC-SM, GP-GC, GC, GC-GM	A-6, A-2-4	0	0-11	35-75	15-70	10-65	5-55	21-34	6-13
21A:												
Lobdell---------	0-8	Silt loam	CL, CL-ML	A-4	0	0-1	95-100	90-100	80-100	65-90	21-31	6-11
	8-48	Loam, silt loam	CL, SC	A-4	0	0-3	85-100	75-100	65-100	45-90	23-31	7-11
	48-62	Loam, silt loam	CL, SC	A-4	0	0-3	85-100	75-100	65-100	45-90	23-31	7-11
Orrville--------	0-6	Loam	CL, CL-ML	A-4	0	0-1	95-100	90-100	80-95	55-75	21-31	6-11
	6-34	Loam, silt loam	CL, SC	A-4	0	0-1	80-100	75-100	65-100	45-90	23-31	7-11
	34-62	Sandy loam, loam, silty clay loam, gravelly sandy loam, silt loam	SC, CL	A-2-4, A-4, A-6	0	0-3	75-100	65-100	40-100	20-95	23-34	7-13
22C, 22E:												
Oriskany--------	0-2	Cobbly loam	CL-ML, ML, SC-SM, SM	A-4	0	10-20	75-90	70-90	60-85	40-65	13-21	1-6
	2-12	Very cobbly loam, cobbly loam, extremely cobbly sandy loam	CL-ML, ML, SM, SC-SM	A-4, A-1, A-2-4	0	10-50	65-90	55-90	35-85	15-65	13-21	1-6
	12-62	Very cobbly clay loam, very cobbly sandy clay loam, very cobbly loam, extremely cobbly loam	CL, CL-ML, ML, SM, SC, SC-SM	A-4, A-1, A-6, A-2-4	0	30-60	60-90	50-85	40-85	20-70	16-39	3-16

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
23A:												
Philo-----------	0-8	Fine sandy loam	SC-SM, SM	A-4	0	0-8	85-100	80-100	55-85	30-55	16-23	3-7
	8-62	Fine sandy loam, sandy loam, loam	SC-SM, SM, ML, CL-ML	A-4, A-2-4	0	0-8	85-100	80-100	50-95	25-75	16-23	3-7
24D, 24E:												
Pinveville------	0-3	Channery loam	SC, SC-SM	A-4, A-2-4	0	0-10	60-80	50-75	40-70	30-55	21-30	6-11
	3-62	Channery clay loam, clay loam, very channery sandy loam, loam	CL, CL-ML, SC, SC-SM, GP-GC, GC, GC-GM	A-6, A-4, A-2-4	0	0-15	45-90	30-85	15-85	10-65	23-34	7-13
25.												
Pits												
26A:												
Pope------------	0-8	Fine sandy loam	SM, SC-SM	A-4	0	0-8	85-100	80-100	55-85	30-55	12-21	1-6
	8-51	Fine sandy loam, loam, gravelly sandy loam	SM, SC-SM, ML, CL-ML	A-4, A-2-4, A-1	0	0-7	70-100	60-100	40-95	20-75	12-23	1-7
	51-62	Fine sandy loam, silt loam, extremely gravelly sand	SM, SC-SM, ML, CL-ML, GP-GM	A-4, A-2-4, A-1	0	0-11	40-100	20-100	10-100	5-90	12-23	1-7
27D, 27E:												
Poplimento------	0-8	Silt loam	CL, CL-ML	A-4	0	0-2	80-100	75-100	65-100	50-90	22-31	6-11
	8-15	Silty clay loam, clay, loam	CL, CH, MH, ML	A-7, A-4	0	0-2	80-100	75-100	65-100	45-95	25-61	8-28
	15-55	Clay, silty clay, silty clay loam	CL, CH, MH, ML	A-7	0	0-5	80-100	75-100	70-100	60-95	39-57	16-26
	55-62	Silty clay, clay, very channery silty clay loam	CL, GC	A-7, A-2-6	0	0-5	45-100	30-100	30-100	25-95	31-52	11-23

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
27D, 27E:												
Berks-----------	0-5	Silt loam	CL-ML, CL, ML	A-4	0	0-2	80-85	75-80	70-80	55-75	12-28	1-10
	5-16	Very channery silt loam, extremely channery loam, channery silty clay loam	SC, SM, SC-SM, CL, CL-ML, ML, GC-GM, GC, GM	A-2-4, A-4, A-6, A-1	0	0-10	35-80	15-75	15-75	10-70	12-36	1-14
	16-29	Extremely channery silt loam, very channery silt loam, extremely channery loam	GC-GM, GC, GM, SM, SC, SC-SM	A-2-4, A-1, A-4	0	0-10	30-60	5-45	5-45	5-40	12-25	1-8
	29-39	Bedrock			---	---	---	---	---	---	---	---
28B, 28C, 28D:												
Shottower-------	0-10	Silt loam	CL, CL-ML	A-4	0	0-8	85-100	80-100	75-100	55-90	16-25	5-9
	10-37	Clay, gravelly sandy clay loam, silty clay loam	CL, SC	A-6, A-2-6	0	0-13	70-100	60-100	50-100	20-95	27-42	10-18
	37-62	Clay, very cobbly sandy clay loam, silty clay loam	CL, CH, SC	A-6, A-7, A-2-4	0	0-36	55-100	45-100	35-100	15-95	24-56	9-26
29B, 29C:												
Timberville-----	0-3	Silt loam	CL, ML, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	12-30	1-11
	3-9	Silt loam, loam, very gravelly fine sandy loam	CL, CL-ML, ML, GM, GC, GC-GM	A-4, A-1, A-2-4	0	0	45-100	25-100	20-100	10-90	12-30	1-11
	9-28	Silt loam, silty clay loam, very gravelly loam	CL, CL-ML, GC, GC-GM	A-6, A-1, A-2-4	0	0	45-100	25-100	25-100	15-95	19-39	5-16
	28-62	Clay loam, clay, very gravelly clay loam, silty clay loam	CL, CH, MH, ML, GC, GM	A-7, A-2-7	0	0	45-100	30-100	25-100	20-95	39-61	16-28

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
30C, 30D, 31C, 31D, 31E:												
Tumbling-------	0-4	Loam	ML, CL-ML, CL	A-4	0	0-8	85-100	80-100	70-95	50-75	13-25	2-9
	4-8	Loam, clay loam, cobbly silt loam	CL-ML, CL, ML	A-4, A-6	0-7	0-29	80-100	80-100	65-100	45-90	13-31	2-13
	8-61	Gravelly clay, clay, cobbly sandy clay loam, silty clay loam, clay loam	CL, SC	A-6, A-2-6	0-7	0-21	75-100	70-100	55-100	25-95	31-45	13-21
32. Udorthents												
33. Urban land-Udorthents												
34D, 34E:												
Wallen----------	0-2	Gravelly loam	SC-SM, SC, SM, ML, CL, CL-ML	A-4	0-7	0-7	70-85	60-75	50-70	35-55	14-25	2-8
	2-26	Very gravelly loam, very gravelly silt loam, extremely gravelly sandy loam	SC-SM, SC, SM, GM, GC, GC-GM	A-2-4, A-4, A-1	0-6	0-11	40-65	25-50	15-50	5-45	14-25	2-8
	26-36	Bedrock			---	---	---	---	---	---	---	---
Alticrest-------	0-3	Fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0	85-100	75-100	55-85	30-55	14-22	2-7
	3-27	Sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	85-100	75-100	45-95	25-75	14-23	2-7
	27-30	Loamy sand, sandy loam, sand	SM, SP-SM	A-4, A-1, A-2-4	0	0	85-100	75-100	40-75	5-40	10-16	NP-3
	30-40	Bedrock			---	---	---	---	---	---	---	---

Table 15.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
35F:												
Wallen----------	0-2	Gravelly loam	SC-SM, SC, SM, ML, CL, CL-ML	A-4	0-7	0-7	70-85	60-75	50-70	35-55	14-25	2-8
	2-26	Very gravelly loam, very gravelly silt loam, extremely gravelly sandy loam	SC-SM, SC, SM, GM, GC, GC-GM	A-2-4, A-4, A-1	0-6	0-11	40-65	25-50	15-50	5-45	14-25	2-8
	26-36	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												
36C, 36D, 36E:												
Watahala--------	0-3	Gravelly loam	SC, SC-SM, SM	A-4	0	0-7	65-80	55-75	50-70	35-55	16-31	3-11
	3-23	Gravelly loam, very gravelly loam, silt loam	SC, SC-SM, SM, CL-ML, CL, ML	A-4, A-2-4	0	0-7	55-85	45-80	35-80	25-70	16-31	3-11
	23-36	Gravelly loam, silty clay loam, very gravelly silt loam	SC, CL	A-4, A-6, A-2-4	0	0-7	55-85	45-80	35-80	25-75	23-39	7-16
	36-63	Clay, silty clay, gravelly silty clay	MH, CH, SC, SM	A-7	0	0-3	60-100	50-100	45-100	40-95	45-70	20-33
Frederick-------	0-8	Gravelly loam	SC, SM, SC-SM	A-4, A-2-4	0	0	60-80	50-75	45-70	30-55	13-31	1-11
	8-24	Clay, silty clay loam, gravelly clay loam	CH, CL, MH, ML, SM, SC	A-7	0	0	60-100	50-100	45-100	35-95	39-61	16-28
	24-62	Clay, silty clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-75	18-36
W.												
Water												

Table 16.—Physical Soil Properties

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
1A, 1B:														
Allegheny------	0-5	25-50	30-50	15-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	5-30	10-75	10-70	18-35	1.20-1.50	4.00-14.00	0.08-0.22	0.0-2.9	0.0-0.5	.32	.32			
	30-62	25-80	5-50	10-35	1.20-1.40	4.00-14.00	0.07-0.19	0.0-2.9	0.0-0.5	.37	.37			
2D:														
Alticrest------	0-3	55-80	10-40	8-18	1.40-1.55	14.00-42.00	0.12-0.16	0.0-2.9	0.5-2.0	.28	.32	2	3	86
	3-27	35-80	10-50	8-18	1.40-1.55	14.00-42.00	0.10-0.19	0.0-2.9	0.0-0.5	.24	.28			
	27-30	50-95	5-45	3-10	1.40-1.60	42.00-141.00	0.04-0.13	0.0-2.9	0.0-0.5	.24	.28			
	30-40	---	---	---	---	0.00-4.00	---	---	---	---	---			
Gilpin---------	0-2	10-35	50-75	15-27	1.20-1.40	4.00-14.00	0.17-0.20	0.0-2.9	0.5-2.5	.32	.37	3	6	48
	2-5	10-50	30-70	18-35	1.20-1.40	4.00-14.00	0.09-0.20	0.0-2.9	0.0-0.5	.37	.43			
	5-29	10-50	20-70	18-35	1.20-1.50	4.00-14.00	0.06-0.20	0.0-2.9	0.0-0.5	.37	.43			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
3E:														
Beech Grove----	0-3	5-35	50-80	10-27	1.20-1.50	4.00-14.00	0.11-0.22	0.0-2.9	0.5-2.5	.32	.43	1	4L	86
	3-13	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	--	8	0
4E, 4F:														
Berks----------	0-5	5-40	50-80	5-23	1.20-1.50	4.00-42.00	0.17-0.18	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	5-16	5-50	30-80	5-32	1.20-1.60	4.00-42.00	0.04-0.11	0.0-2.9	0.0-0.5	.15	.49			
	16-29	5-50	30-80	5-20	1.20-1.60	14.00-42.00	0.01-0.10	0.0-2.9	0.0-0.5	.10	.49			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
Poplimento-----	0-8	5-30	50-75	17-27	1.20-1.35	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.32	.32	5	6	48
	8-15	5-40	10-70	20-60	1.30-1.60	1.40-4.00	0.09-0.22	6.0-8.9	0.0-1.0	.37	.37			
	15-55	5-35	15-60	35-55	1.30-1.55	1.40-4.00	0.09-0.15	6.0-8.9	0.0-0.5	.24	.24			
	55-62	5-35	20-60	27-50	1.25-1.50	1.40-4.00	0.04-0.15	3.0-5.9	0.0-0.5	.37	.37			
5D, 5E, 5F:														
Berks----------	0-5	5-40	50-80	5-23	1.20-1.50	4.00-42.00	0.17-0.18	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	5-16	5-50	30-80	5-32	1.20-1.60	4.00-42.00	0.04-0.11	0.0-2.9	0.0-0.5	.15	.49			
	16-29	5-50	30-80	5-20	1.20-1.60	14.00-42.00	0.01-0.10	0.0-2.9	0.0-0.5	.10	.49			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
Weikert--------	0-3	5-40	50-80	5-25	1.20-1.40	14.00-42.00	0.17-0.20	0.0-2.9	0.5-2.0	.32	.43	1	5	56
	3-15	5-50	30-80	5-27	1.20-1.40	14.00-42.00	0.05-0.10	0.0-2.9	0.0-0.5	.15	.49			
	15-25	---	---	---	---	1.40-42.00	---	---	---	---	---			

Table 16.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
6E:														
Bethesda-------	0-7	5-30	50-80	18-27	1.35-1.50	1.40-4.00	0.12-0.17	0.0-2.9	0.5-2.0	.24	.37	5	6	38
	7-62	5-50	30-80	18-35	1.60-1.90	1.40-4.00	0.03-0.05	0.0-2.9	0.0-0.5	.10	.43			
Fairpoint------	0-5	5-30	50-80	18-27	1.40-1.55	1.40-4.00	0.13-0.17	0.0-2.9	0.5-2.0	.24	.37	5	6	38
	5-62	5-50	30-80	18-35	1.60-1.80	1.40-4.00	0.03-0.13	3.0-5.9	0.0-0.5	.20	.49			
Sewell---------	0-10	50-80	5-40	5-18	1.35-1.65	14.00-141.00	0.12-0.13	0.0-2.9	0.5-2.0	.10	.15	5	3	56
	10-62	35-85	5-50	5-18	1.35-1.65	14.00-141.00	0.05-0.16	0.0-2.9	0.0-0.5	.10	.28			
7C, 7D:														
Carbo----------	0-3	5-30	50-75	20-27	1.20-1.40	4.00-14.00	0.19-0.22	3.0-5.9	0.5-2.5	.37	.37	2	6	48
	3-8	5-25	40-70	20-40	1.30-1.45	4.00-14.00	0.11-0.22	3.0-5.9	0.0-1.0	.37	.37			
	8-28	5-30	5-35	60-80	1.30-1.45	0.42-1.40	0.09-0.12	6.0-8.9	0.0-0.5	.17	.17			
	28-38	---	---	---	---	0.00-4.00	---	---	---	---	---			
8C, 8D, 8E:														
Carbo----------	0-3	5-30	50-75	20-27	1.20-1.40	4.00-14.00	0.19-0.22	3.0-5.9	0.5-2.5	.37	.37	2	6	48
	3-8	5-25	40-70	20-40	1.30-1.45	4.00-14.00	0.11-0.22	3.0-5.9	0.0-1.0	.37	.37			
	8-28	5-30	5-35	60-80	1.30-1.45	0.42-1.40	0.09-0.12	6.0-8.9	0.0-0.5	.17	.17			
	28-38	---	---	---	---	0.00-4.00	---	---	---	---	---			
Beech Grove----	0-3	5-35	50-80	10-27	1.20-1.50	4.00-14.00	0.11-0.22	0.0-2.9	0.5-2.5	.32	.43	1	4L	86
	3-13	---	---	---	---	0.00-4.00	---	---	---	---	---			
9C, 9D, 9E:														
Carbo----------	0-3	5-30	50-75	20-27	1.20-1.40	4.00-14.00	0.19-0.22	3.0-5.9	0.5-2.5	.37	.37	2	6	48
	3-8	5-25	40-70	20-40	1.30-1.45	4.00-14.00	0.11-0.22	3.0-5.9	0.0-1.0	.37	.37			
	8-28	5-30	5-35	60-80	1.30-1.45	0.42-1.40	0.09-0.12	6.0-8.9	0.0-0.5	.17	.17			
	28-38	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	--	8	0
10A:														
Chagrin--------	0-6	25-51	29-49	10-25	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-4.0	.24	.24	5	6	48
	6-42	5-78	5-80	18-35	1.25-1.50	4.00-14.00	0.10-0.22	0.0-2.9	0.3-1.0	.17	.20			
	42-62	5-82	5-80	5-25	1.30-1.55	4.00-14.00	0.10-0.22	0.0-2.9	0.3-1.0	.24	.28			
Lobdell--------	0-8	5-48	51-80	15-27	1.20-1.40	4.00-14.00	0.20-0.22	0.0-2.9	1.0-4.0	.32	.32	5	6	48
	8-48	5-51	29-80	18-27	1.20-1.40	4.00-14.00	0.14-0.22	0.0-2.9	0.2-1.0	.37	.37			
	48-62	5-51	29-80	18-27	1.20-1.40	4.00-42.00	0.14-0.22	0.0-2.9	0.2-1.0	.37	.37			
11B, 11C:														
Escatawba------	0-5	30-50	30-50	8-20	1.15-1.30	4.00-14.00	0.15-0.19	0.0-2.9	0.5-3.0	.28	.32	5	5	56
	5-17	10-75	15-80	8-20	1.15-1.30	4.00-14.00	0.13-0.22	0.0-2.9	0.0-0.5	.37	.43			
	17-38	10-50	30-70	18-27	1.30-1.55	4.00-14.00	0.12-0.22	0.0-2.9	0.0-0.5	.32	.37			
	38-62	10-45	10-50	35-50	1.30-1.55	1.40-4.00	0.06-0.11	0.0-2.9	0.0-0.5	.24	.28			

Table 16.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
11B, 11C:														
Jefferson------	0-4	30-50	30-50	10-25	1.30-1.50	14.00-42.00	0.14-0.19	0.0-2.9	0.5-3.0	.24	.28	5	5	56
	4-11	10-80	10-80	10-25	1.30-1.65	14.00-42.00	0.07-0.20	0.0-2.9	0.5-1.0	.32	.37			
	11-42	20-80	10-50	18-35	1.30-1.65	14.00-42.00	0.08-0.17	0.0-2.9	0.0-0.5	.24	.24			
	42-62	20-80	10-50	15-30	1.30-1.65	14.00-42.00	0.02-0.10	0.0-2.9	0.0-0.5	.20	.32			
12B, 12C, 12D, 12E, 12F:														
Frederick-----	0-8	5-45	30-50	7-27	1.25-1.50	14.00-42.00	0.10-0.14	0.0-2.9	0.5-2.5	.15	.28	5	6	38
	8-24	2-40	10-60	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.15	.17			
	24-62	2-30	10-55	40-75	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.10	.15			
13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:														
Frederick-----	0-9	5-35	50-80	7-27	1.25-1.50	14.00-42.00	0.17-0.22	0.0-2.9	0.5-2.5	.24	.32	5	6	48
	9-21	2-30	10-60	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.15	.17			
	21-62	2-30	10-55	40-75	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.10	.15			
15C, 15D, 15E, 15F:														
Frederick-----	0-9	5-35	50-80	7-27	1.25-1.50	14.00-42.00	0.17-0.22	0.0-2.9	0.5-2.5	.24	.32	5	6	48
	9-21	2-30	10-60	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.15	.17			
	21-62	2-30	10-55	40-75	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.10	.15			
Carbo---------	0-3	5-30	50-75	20-27	1.20-1.40	4.00-14.00	0.19-0.22	3.0-5.9	0.5-2.5	.37	.37	2	6	48
	3-8	5-25	40-70	20-40	1.30-1.45	4.00-14.00	0.11-0.22	3.0-5.9	0.0-1.0	.37	.37			
	8-28	5-30	5-35	60-80	1.30-1.45	0.42-1.40	0.09-0.12	6.0-8.9	0.0-0.5	.17	.17			
	28-38	---	---	---	---	0.00-4.00	---	---	---	---	---			
16C, 16D, 16E:														
Gilpin---------	0-2	10-35	50-75	15-27	1.20-1.40	4.00-14.00	0.17-0.20	0.0-2.9	0.5-2.5	.32	.37	3	6	48
	2-5	10-50	30-70	18-35	1.20-1.40	4.00-14.00	0.09-0.20	0.0-2.9	0.0-0.5	.37	.43			
	5-29	10-50	20-70	18-35	1.20-1.50	4.00-14.00	0.06-0.20	0.0-2.9	0.0-0.5	.37	.43			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
17D, 17E, 17F:														
Gilpin---------	0-2	10-35	50-75	15-27	1.20-1.40	4.00-14.00	0.17-0.20	0.0-2.9	0.5-2.5	.32	.37	3	6	48
	2-5	10-50	30-70	18-35	1.20-1.40	4.00-14.00	0.09-0.20	0.0-2.9	0.0-0.5	.37	.43			
	5-29	10-50	20-70	18-35	1.20-1.50	4.00-14.00	0.06-0.20	0.0-2.9	0.0-0.5	.37	.43			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
Berks----------	0-5	5-40	50-80	5-23	1.20-1.50	4.00-42.00	0.17-0.18	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	5-16	5-50	30-80	5-32	1.20-1.60	4.00-42.00	0.04-0.11	0.0-2.9	0.0-0.5	.15	.49			
	16-29	5-50	30-80	5-20	1.20-1.60	14.00-42.00	0.01-0.10	0.0-2.9	0.0-0.5	.10	.49			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			

Table 16.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
18A:														
Holly----------	0-4	25-52	28-50	15-27	1.20-1.40	4.00-14.00	0.16-0.19	0.0-2.9	1.0-5.0	.24	.24	5	6	48
	4-34	15-50	28-65	18-35	1.20-1.50	1.40-14.00	0.11-0.22	0.0-2.9	0.2-1.0	.37	.37			
	34-62	15-95	5-65	5-40	1.20-1.40	4.00-42.00	0.03-0.22	0.0-2.9	0.2-1.0	.32	.37			
19E:														
Itmann---------	0-62	35-85	5-50	4-15	1.00-1.30	14.00-141.00	0.01-0.08	0.0-2.9	0.0-0.5	.02	.24	5	8	0
20D:														
Jefferson------	0-4	30-50	30-50	10-25	1.30-1.50	14.00-42.00	0.14-0.19	0.0-2.9	0.5-3.0	.24	.28	5	5	56
	4-11	10-80	10-80	10-25	1.30-1.65	14.00-42.00	0.07-0.20	0.0-2.9	0.5-1.0	.32	.37			
	11-42	20-80	10-50	18-35	1.30-1.65	14.00-42.00	0.08-0.17	0.0-2.9	0.0-0.5	.24	.24			
	42-62	20-80	10-50	15-30	1.30-1.65	14.00-42.00	0.02-0.10	0.0-2.9	0.0-0.5	.20	.32			
21A:														
Lobdell--------	0-8	5-48	51-80	15-27	1.20-1.40	4.00-14.00	0.20-0.22	0.0-2.9	1.0-4.0	.32	.32	5	6	48
	8-48	5-51	29-80	18-27	1.20-1.40	4.00-14.00	0.14-0.22	0.0-2.9	0.2-1.0	.37	.37			
	48-62	5-51	29-80	18-27	1.20-1.40	4.00-42.00	0.14-0.22	0.0-2.9	0.2-1.0	.37	.37			
Orrville-------	0-6	25-51	29-49	15-27	1.20-1.40	4.00-14.00	0.17-0.19	0.0-2.9	1.0-4.0	.24	.24	5	6	48
	6-34	5-51	29-80	18-27	1.20-1.45	4.00-14.00	0.14-0.22	0.0-2.9	0.2-1.0	.37	.37			
	34-62	5-82	5-70	18-30	1.30-1.50	4.00-42.00	0.09-0.22	0.0-2.9	0.2-1.0	.15	.20			
22C, 22E:														
Oriskany-------	0-2	35-50	30-50	7-15	1.20-1.40	14.00-42.00	0.13-0.17	0.0-2.9	0.5-3.0	.20	.32	5	5	48
	2-12	40-80	5-50	7-15	1.20-1.40	14.00-42.00	0.07-0.17	0.0-2.9	0.0-0.5	.17	.43			
	12-62	20-80	5-50	10-35	1.30-1.65	14.00-42.00	0.07-0.16	0.0-2.9	0.0-0.5	.10	.28			
23A:														
Philo----------	0-8	50-80	5-35	10-18	1.20-1.40	4.00-42.00	0.13-0.16	0.0-2.9	1.0-4.0	.17	.17	5	3	86
	8-62	35-80	5-50	10-18	1.20-1.40	4.00-42.00	0.10-0.19	0.0-2.9	0.2-1.0	.24	.28			
24D, 24E:														
Pineville------	0-3	25-80	30-50	15-25	1.00-1.30	14.00-42.00	0.10-0.14	0.0-2.9	0.5-3.0	.17	.24	5	6	38
	3-62	25-70	10-50	18-30	1.30-1.60	14.00-42.00	0.04-0.16	0.0-2.9	0.0-0.5	.20	.28			
25.														
Pits														
26A:														
Pope-----------	0-8	50-80	5-40	5-15	1.20-1.40	14.00-42.00	0.13-0.16	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	8-51	35-80	5-50	5-18	1.30-1.60	4.00-42.00	0.09-0.19	0.0-2.9	0.2-1.0	.32	.32			
	51-62	25-95	2-70	5-18	1.30-1.60	4.00-42.00	0.01-0.22	0.0-2.9	0.2-1.0	.37	.37			

Table 16.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
27D, 27E:														
Poplimento-----	0-8	5-30	50-75	17-27	1.20-1.35	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.32	.32	5	6	48
	8-15	5-40	10-70	20-60	1.30-1.60	1.40-4.00	0.09-0.22	6.0-8.9	0.0-1.0	.37	.37			
	15-55	5-35	15-60	35-55	1.30-1.55	1.40-4.00	0.09-0.15	6.0-8.9	0.0-0.5	.24	.24			
	55-62	5-35	20-60	27-50	1.25-1.50	1.40-4.00	0.04-0.15	3.0-5.9	0.0-0.5	.37	.37			
Berks----------	0-5	5-40	50-80	5-23	1.20-1.50	4.00-42.00	0.17-0.18	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	5-16	5-50	30-80	5-32	1.20-1.60	4.00-42.00	0.04-0.11	0.0-2.9	0.0-0.5	.15	.49			
	16-29	5-50	30-80	5-20	1.20-1.60	14.00-42.00	0.01-0.10	0.0-2.9	0.0-0.5	.10	.49			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
28B, 28C, 28D:														
Shottower------	0-10	5-30	50-75	15-27	1.30-1.45	4.00-14.00	0.18-0.22	0.0-2.9	0.5-3.0	.32	.32	5	6	48
	10-37	5-60	5-60	30-50	1.45-1.60	4.00-14.00	0.07-0.15	3.0-5.9	0.0-0.5	.20	.20			
	37-62	5-60	5-60	25-70	1.45-1.60	4.00-14.00	0.05-0.15	3.0-5.9	0.0-0.5	.17	.17			
29B, 29C:														
Timberville----	0-3	5-40	50-80	6-25	1.30-1.50	14.00-42.00	0.17-0.22	0.0-2.9	1.0-4.0	.32	.32	5	6	48
	3-9	5-80	15-80	6-25	1.30-1.50	14.00-42.00	0.04-0.22	0.0-2.9	0.5-3.0	.43	.43			
	9-28	5-50	30-80	13-35	1.30-1.50	4.00-14.00	0.03-0.22	0.0-2.9	0.0-1.0	.43	.43			
	28-62	5-40	15-55	35-60	1.40-1.55	4.00-14.00	0.04-0.15	3.0-5.9	0.0-0.5	.28	.28			
30C, 30D, 31C, 31D, 31E:														
Tumbling------	0-4	25-50	30-50	10-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	0.5-3.0	.24	.32	5	5	56
	4-8	10-50	30-75	10-35	1.20-1.45	4.00-14.00	0.10-0.22	0.0-2.9	0.5-1.0	.28	.37			
	8-61	10-60	10-60	34-55	1.20-1.40	4.00-14.00	0.08-0.15	0.0-2.9	0.0-0.5	.15	.20			
32:														
Udorthents-----	---	---	---	---	---	---	---	---	---	---	---	--	6	---
33:														
Urban land.														
Udorthents-----	---	---	---	---	---	---	---	---	---	---	---	--	6	---
34D, 34E:														
Wallen---------	0-2	35-50	30-50	8-20	1.40-1.55	14.00-42.00	0.11-0.14	0.0-2.9	0.5-2.0	.28	.43	2	5	48
	2-26	25-80	5-65	8-20	1.40-1.55	14.00-42.00	0.03-0.11	0.0-2.9	0.0-0.5	.20	.49			
	26-36	---	---	---	---	0.00-4.00	---	---	---	---	---			
Alticrest------	0-3	55-80	10-40	8-18	1.40-1.55	14.00-42.00	0.12-0.16	0.0-2.9	0.5-2.0	.28	.32	2	3	86
	3-27	35-80	10-50	8-18	1.40-1.55	14.00-42.00	0.10-0.19	0.0-2.9	0.0-0.5	.24	.28			
	27-30	50-95	5-45	3-10	1.40-1.60	42.00-141.00	0.04-0.13	0.0-2.9	0.0-0.5	.24	.28			
	30-40	---	---	---	---	0.00-4.00	---	---	---	---	---			

Table 16.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
35F:														
Wallen----------	0-2	35-50	30-50	8-20	1.40-1.55	14.00-42.00	0.11-0.14	0.0-2.9	0.5-2.0	.28	.43	2	5	48
	2-26	25-80	5-65	8-20	1.40-1.55	14.00-42.00	0.03-0.11	0.0-2.9	0.0-0.5	.20	.49			
	26-36	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	--	8	0
36C, 36D, 36E:														
Watahala-------	0-3	25-50	30-50	10-27	1.25-1.45	14.00-42.00	0.11-0.13	0.0-2.9	0.5-2.5	.17	.32	4	6	38
	3-23	2-50	30-80	10-27	1.20-1.50	14.00-42.00	0.10-0.18	0.0-2.9	0.0-0.5	.20	.37			
	23-36	2-50	30-80	18-35	1.20-1.50	4.00-14.00	0.06-0.18	0.0-2.9	0.0-0.5	.17	.37			
	36-63	2-40	2-55	43-70	1.20-1.40	1.40-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.20	.20			
Frederick------	0-8	5-45	30-50	7-27	1.25-1.50	14.00-42.00	0.10-0.14	0.0-2.9	0.5-2.5	.15	.28	5	6	38
	8-24	2-40	10-60	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.15	.17			
	24-62	2-30	10-55	40-75	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.10	.15			
W.														
Water														

Table 17.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
1A, 1B:				
Allegheny	0-5	6.0-14	4.0-10	3.6-5.5
	5-30	4.0-10	3.0-7.0	3.6-5.5
	30-62	2.0-10	2.0-7.0	3.6-5.5
2D:				
Alticrest	0-3	3.0-9.0	2.0-7.0	4.5-5.5
	3-27	2.0-6.0	2.0-4.0	4.5-5.5
	27-30	1.0-4.0	1.0-3.0	4.5-5.5
	30-40	---	---	---
Gilpin	0-2	5.0-12	4.0-9.0	3.6-5.5
	2-5	5.0-10	3.0-7.0	3.6-5.5
	5-29	5.0-10	3.0-7.0	3.6-5.5
	29-39	---	---	---
3E:				
Beech Grove	0-3	5.0-15	4.0-11	6.1-8.4
	3-13	---	---	---
Rock outcrop.				
4E, 4F:				
Berks	0-5	2.0-10	2.0-8.0	4.5-6.5
	5-16	1.0-9.0	1.0-7.0	4.5-6.5
	16-29	1.0-6.0	1.0-5.0	4.5-6.5
	29-39	---	---	---
Poplimento	0-8	5.0-12	4.0-9.0	4.5-6.5
	8-15	5.0-17	4.0-13	4.5-6.5
	15-55	9.0-15	7.0-11	4.5-6.5
	55-62	7.0-14	5.0-10	4.5-6.5
5D, 5E, 5F:				
Berks	0-5	2.0-10	2.0-8.0	3.6-6.0
	5-16	1.0-9.0	1.0-7.0	3.6-6.0
	16-29	1.0-6.0	1.0-5.0	3.6-6.0
	29-39	---	---	---
Weikert	0-3	2.0-11	2.0-8.0	5.2-6.0
	3-15	1.0-8.0	1.0-6.0	5.2-6.0
	15-25	---	---	---
6E:				
Bethesda	0-7	6.0-11	4.0-8.0	3.6-5.5
	7-62	5.0-10	3.0-7.0	3.6-5.5
Fairpoint	0-5	6.0-11	4.0-8.0	5.6-7.3
	5-62	5.0-10	3.0-7.0	5.6-7.3
Sewell	0-10	2.0-9.0	2.0-7.0	3.6-5.5
	10-62	1.0-6.0	1.0-4.0	3.6-5.5

Table 17.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
7C, 7D:				
Carbo	0-3	8.0-15	6.0-11	4.5-7.3
	3-8	7.0-16	5.0-12	4.5-7.3
	8-28	21-30	16-22	5.6-7.8
	28-38	---	---	---
8C, 8D, 8E:				
Carbo	0-3	8.0-15	6.0-11	4.5-7.3
	3-8	7.0-16	5.0-12	4.5-7.3
	8-28	21-30	16-22	5.6-7.8
	28-38	---	---	---
Beech Grove	0-3	5.0-15	4.0-11	6.1-8.4
	3-13	---	---	---
9C, 9D, 9E:				
Carbo	0-3	8.0-15	6.0-11	4.5-7.3
	3-8	7.0-16	5.0-12	4.5-7.3
	8-28	21-30	16-22	5.6-7.8
	28-38	---	---	---
Rock outcrop.				
10A:				
Chagrin	0-6	5.0-15	4.0-11	5.6-7.3
	6-42	5.0-11	4.0-8.0	5.6-7.3
	42-62	2.0-9.0	1.0-6.0	5.1-7.3
Lobdell	0-8	6.0-16	5.0-12	5.1-7.3
	8-48	5.0-8.0	3.0-6.0	5.1-7.3
	48-62	5.0-8.0	3.0-6.0	5.6-7.3
11B, 11C:				
Escatawba	0-5	3.0-12	2.0-9.0	3.5-5.5
	5-17	2.0-6.0	2.0-5.0	3.5-5.5
	17-38	5.0-8.0	3.0-6.0	4.5-5.5
	38-62	9.0-14	7.0-10	4.5-5.5
Jefferson	0-4	4.0-13	4.0-10	4.5-6.5
	4-11	4.0-9.0	3.0-6.0	4.5-6.5
	11-42	5.0-10	3.0-7.0	4.5-5.5
	42-62	4.0-9.0	3.0-7.0	4.5-5.5
12B, 12C, 12D, 12E, 12F:				
Frederick	0-8	3.0-12	2.0-9.0	4.5-6.0
	8-24	9.0-16	7.0-12	4.5-6.0
	24-62	10-20	8.0-15	4.5-6.0
13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:				
Frederick	0-9	3.0-12	2.0-9.0	4.5-6.0
	9-21	9.0-16	7.0-12	4.5-6.0
	21-62	10-20	8.0-15	4.5-6.0

Table 17.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
15C, 15D, 15E, 15F:				
Frederick------------	0-9	3.0-12	2.0-9.0	4.5-6.0
	9-21	9.0-16	7.0-12	4.5-6.0
	21-62	10-20	8.0-15	4.5-6.0
Carbo----------------	0-3	8.0-15	6.0-11	4.5-7.3
	3-8	7.0-16	5.0-12	4.5-7.3
	8-28	21-30	16-22	5.6-7.8
	28-38	---	---	---
16C, 16D, 16E:				
Gilpin---------------	0-2	5.0-12	4.0-9.0	3.6-5.5
	2-5	5.0-10	3.0-7.0	3.6-5.5
	5-29	5.0-10	3.0-7.0	3.6-5.5
	29-39	---	---	---
17D, 17E, 17F:				
Gilpin---------------	0-2	5.0-12	4.0-9.0	3.6-5.5
	2-5	5.0-10	3.0-7.0	3.6-5.5
	5-29	5.0-10	3.0-7.0	3.6-5.5
	29-39	---	---	---
Berks----------------	0-5	2.0-10	2.0-8.0	3.6-6.5
	5-16	1.0-9.0	1.0-7.0	3.6-6.5
	16-29	1.0-6.0	1.0-5.0	3.6-6.5
	29-39	---	---	---
18A:				
Holly----------------	0-4	6.0-18	4.5-14	5.1-7.3
	4-34	5.1-11	3.8-8.2	5.1-7.3
	34-62	1.8-12	1.4-9.2	5.1-7.3
19E:				
Itmann---------------	0-62	1.0-5.0	1.0-4.0	3.6-5.5
20D:				
Jefferson------------	0-4	4.0-13	4.0-10	4.5-6.5
	4-11	4.0-9.0	3.0-6.0	4.5-6.5
	11-42	5.0-10	3.0-7.0	4.5-5.5
	42-62	4.0-9.0	3.0-7.0	4.5-5.5
21A:				
Lobdell--------------	0-8	6.0-16	5.0-12	5.1-7.3
	8-48	5.0-8.0	3.0-6.0	5.1-7.3
	48-62	5.0-8.0	3.0-6.0	5.6-7.3
Orrville-------------	0-6	6.0-16	5.0-12	5.1-6.5
	6-34	5.0-9.0	4.0-7.0	5.1-6.5
	34-62	5.0-10	4.0-7.0	5.1-7.3
22C, 22E:				
Oriskany-------------	0-2	3.0-11	2.0-8.0	4.5-5.5
	2-12	2.0-5.0	1.0-4.0	4.5-5.5
	12-62	3.0-10	2.0-7.0	4.5-5.5
23A:				
Philo----------------	0-8	5.0-14	4.0-10	4.5-6.0
	8-62	3.0-7.0	2.0-5.0	4.5-6.0

Table 17.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
24D, 24E:				
Pineville	0-3	5.0-13	4.0-10	3.6-7.3
	3-62	5.0-9.0	3.0-7.0	3.6-5.5
25.				
Pits				
26A:				
Pope	0-8	4.0-13	3.0-10	3.6-5.5
	8-51	2.0-7.0	1.0-5.0	3.6-5.5
	51-62	2.0-7.0	1.0-5.0	3.6-5.5
27D, 27E:				
Poplimento	0-8	5.0-12	4.0-9.0	4.5-6.5
	8-15	5.0-17	4.0-13	4.5-6.5
	15-55	9.0-15	7.0-11	4.5-6.5
	55-62	7.0-14	5.0-10	4.5-6.5
Berks	0-5	2.0-10	2.0-8.0	4.5-6.5
	5-16	1.0-9.0	1.0-7.0	4.5-6.5
	16-29	1.0-6.0	1.0-5.0	4.5-6.5
	29-39	---	---	---
28B, 28C, 28D:				
Shottower	0-10	3.0-9.0	2.0-7.0	3.6-6.0
	10-37	3.0-6.0	2.0-5.0	3.6-6.0
	37-62	3.0-8.0	2.0-6.0	3.6-6.0
29B, 29C:				
Timberville	0-3	4.0-15	3.0-11	3.6-6.5
	3-9	3.0-13	2.0-10	3.6-6.5
	9-28	3.0-11	2.0-8.0	3.6-6.5
	28-62	9.0-16	7.0-12	3.6-6.5
30C, 30D, 31C, 31D, 31E:				
Tumbling	0-4	2.0-9.0	2.0-7.0	4.5-5.5
	4-8	2.0-6.0	2.0-4.0	4.5-5.5
	8-61	3.0-7.0	3.0-5.0	4.5-5.5
32.				
Udorthents				
33.				
Urban land-Udorthents				
34D, 34E:				
Wallen	0-2	3.0-10	2.0-7.0	3.5-6.0
	2-26	2.0-6.0	2.0-5.0	3.5-6.0
	26-36	---	---	---
Alticrest	0-3	3.0-9.0	2.0-7.0	4.5-5.5
	3-27	2.0-6.0	2.0-4.0	4.5-5.5
	27-30	1.0-4.0	1.0-3.0	4.5-5.5
	30-40	---	---	---

Table 17.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
35F:				
Wallen---------------	0-2	3.0-10	2.0-7.0	3.5-6.0
	2-26	2.0-6.0	2.0-5.0	3.5-6.0
	26-36	---	---	---
Rock outcrop.				
36C, 36D, 36E:				
Watahala-------------	0-3	4.0-11	3.0-9.0	3.6-5.5
	3-23	3.0-8.0	2.0-6.0	3.6-5.5
	23-36	5.0-10	4.0-7.0	3.6-5.5
	36-63	10-19	8.0-14	4.5-5.5
Frederick------------	0-8	3.0-12	2.0-9.0	4.5-6.0
	8-24	9.0-16	7.0-12	4.5-6.0
	24-62	10-20	8.0-15	4.5-6.0
W.				
Water				

Table 18.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1A:										
Allegheny-----	B	Low								
			January	---	---	---	---	None	Very brief	Rare
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Very rare
			June	---	---	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	---	---	---	---	None	Very brief	Very rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	Very brief	Rare
1B:										
Allegheny-----	B	Medium								
			January	---	---	---	---	None	Very brief	Rare
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Very rare
			June	---	---	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	---	---	---	---	None	Very brief	Very rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	Very brief	Rare

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
2D:										
Alticrest-----	B	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Gilpin--------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
3E:										
Beech Grove---	C	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Rock outcrop--	---	Very high								
			Jan-Dec	---	---	---	---	None	---	None
4E, 4F:										
Berks---------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Poplimento----	C	High								
			Jan-Dec	---	---	---	---	None	---	None
5D, 5E, 5F:										
Berks---------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Weikert-------	D	High								
			Jan-Dec	---	---	---	---	None	---	None
6E:										
Bethesda------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Fairpoint-----	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Sewell--------	C	Medium								
			Jan-Dec	---	---	---	---	None	---	None
7C:										
Carbo---------	C	High								
			Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
7D:										
Carbo	C	Very high								
			Jan-Dec	---	---	---	---	None	---	None
8C:										
Carbo	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Beech Grove	C	High								
			Jan-Dec	---	---	---	---	None	---	None
8D, 8E:										
Carbo	C	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Beech Grove	C	Very high								
			Jan-Dec	---	---	---	---	None	---	None
9C:										
Carbo	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	None
9D, 9E:										
Carbo	C	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
10A:										
Chagrin-------	B	Low								
			January	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			February	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			March	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			May	6.0-6.6	>6.0	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	6.0-6.6	>6.0	---	---	None	Very brief	Occasional
			December	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
Lobdell-------	B	Low								
			January	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			February	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			March	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			April	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			May	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			June	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			November	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
11B, 11C:										
Escatawba-----	B	Medium								
			January	2.5-4.0	4.0-5.0	---	---	None	---	None
			February	2.5-4.0	4.0-5.0	---	---	None	---	None
			March	2.5-4.0	4.0-5.0	---	---	None	---	None
			April	2.5-4.0	4.0-5.0	---	---	None	---	None
			May	2.5-4.0	4.0-5.0	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	2.5-4.0	4.0-5.0	---	---	None	---	None
			December	2.5-4.0	4.0-5.0	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
11B, 11C:										
Jefferson-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
12B, 12C:										
Frederick-----	B	Medium	Jan-Dec	---	---	---	---	None	---	None
12D, 12E, 12F:										
Frederick-----	B	High	Jan-Dec	---	---	---	---	None	---	None
13B, 13C:										
Frederick-----	B	Medium	Jan-Dec	---	---	---	---	None	---	None
13D, 13E, 13F:										
Frederick-----	B	High	Jan-Dec	---	---	---	---	None	---	None
14B, 14C:										
Frederick-----	B	Medium	Jan-Dec	---	---	---	---	None	---	None
14D, 14E:										
Frederick-----	B	High	Jan-Dec	---	---	---	---	None	---	None
15C:										
Frederick-----	B	Medium	Jan-Dec	---	---	---	---	None	---	None
Carbo---------	C	High	Jan-Dec	---	---	---	---	None	---	None
15D, 15E, 15F:										
Frederick-----	B	High	Jan-Dec	---	---	---	---	None	---	None
Carbo---------	C	Very high	Jan-Dec	---	---	---	---	None	---	None
16C:										
Gilpin--------	C	Medium	Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
16D, 16E:										
Gilpin--------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
17D, 17E, 17F:										
Gilpin--------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Berks---------	C	High								
			Jan-Dec	---	---	---	---	None	---	None
18A:										
Holly---------	D	Negligible								
			January	0.0-1.0	>6.0	0.5-1.0	Brief	Occasional	Very brief	Frequent
			February	0.0-1.0	>6.0	0.5-1.0	Brief	Occasional	Very brief	Frequent
			March	0.0-1.0	>6.0	0.5-1.0	Brief	Occasional	Very brief	Frequent
			April	0.0-1.0	>6.0	0.5-1.0	Brief	Occasional	Very brief	Frequent
			May	0.0-1.0	>6.0	0.3-1.0	Brief	Occasional	Very brief	Frequent
			June	0.0-1.0	>6.0	0.3-1.0	Very brief	Rare	Very brief	Occasional
			July	1.0-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Occasional
			August	1.0-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Occasional
			September	1.0-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Occasional
			October	1.0-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Occasional
			November	0.0-1.0	>6.0	0.3-1.0	Brief	Occasional	Very brief	Frequent
			December	0.0-1.0	>6.0	0.5-1.0	Brief	Occasional	Very brief	Frequent
19E:										
Itmann--------	C	Medium								
			Jan-Dec	---	---	---	---	None	---	None
20D:										
Jefferson-----	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
21A:										
Lobdell-------	B	Low								
			January	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			February	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			March	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			April	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			May	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			June	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			November	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
Orrville------	C	Very high								
			January	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			February	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			March	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			April	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			May	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			June	1.0-2.5	>6.0	---	---	None	Very brief	Rare
			July	2.5-6.6	>6.0	---	---	None	Very brief	Rare
			August	2.5-6.6	>6.0	---	---	None	Very brief	Rare
			September	2.5-6.6	>6.0	---	---	None	Very brief	Rare
			October	2.5-6.6	>6.0	---	---	None	Very brief	Rare
			November	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
			December	1.0-2.5	>6.0	---	---	None	Very brief	Occasional
22C:										
Oriskany------	B	Low								
			Jan-Dec	---	---	---	---	None	---	None
22E:										
Oriskany------	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
23A:										
Philo----------	B	Very low								
			January	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			February	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			March	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			April	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			May	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			June	3.0-6.6	>6.0	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	3.0-6.6	>6.0	---	---	None	Very brief	Rare
			November	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			December	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
24D, 24E:										
Pineville-----	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
25.										
Pits										
26A:										
Pope-----------	B	Very low								
			January	---	---	---	---	None	Very brief	Occasional
			February	---	---	---	---	None	Very brief	Occasional
			March	---	---	---	---	None	Very brief	Occasional
			April	---	---	---	---	None	Very brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	---	---	---	---	None	Very brief	Occasional
			December	---	---	---	---	None	Very brief	Occasional
27D, 27E:										
Poplimento----	C	High								
			Jan-Dec	---	---	---	---	None	---	None
Berks---------	C	High								
			Jan-Dec	---	---	---	---	None	---	None

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
28B, 28C:										
Shottower-----	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
28D:										
Shottower-----	B	High								
			Jan-Dec	---	---	---	---	None	---	None
29B:										
Timberville---	B	Medium								
			Jan-Dec	---	---	---	---	None	Very brief	Frequent
29C:										
Timberville---	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
30C:										
Tumbling------	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
30D:										
Tumbling------	B	High								
			Jan-Dec	---	---	---	---	None	---	None
31C:										
Tumbling------	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
31D, 31E:										
Tumbling------	B	High								
			Jan-Dec	---	---	---	---	None	---	None
32:										
Udorthents----	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
33:										
Urban land----	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
Udorthents----	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---

Table 18.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
34D, 34E:										
Wallen--------	B	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Alticrest-----	B	Very high								
			Jan-Dec	---	---	---	---	None	---	None
35F:										
Wallen--------	B	Very high								
			Jan-Dec	---	---	---	---	None	---	None
Rock outcrop--	---	Very high								
			Jan-Dec	---	---	---	---	None	---	None
36C:										
Watahala------	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
Frederick-----	B	Medium								
			Jan-Dec	---	---	---	---	None	---	None
36D, 36E:										
Watahala------	B	High								
			Jan-Dec	---	---	---	---	None	---	None
Frederick-----	B	High								
			Jan-Dec	---	---	---	---	None	---	None
W.										
Water										

Table 19.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
1A, 1B:						
Allegheny----------	---	---	---	Moderate	Low	High
2D:						
Alticrest----------	Bedrock (lithic)	20-40	Indurated	Moderate	Low	High
Gilpin-------------	Bedrock (paralithic)	20-40	Moderately cemented	Moderate	Low	High
3E:						
Beech Grove--------	Bedrock (lithic)	1-8	Indurated	Moderate	Moderate	Low
Rock outcrop-------	Bedrock (lithic)	0-0	Indurated	---	---	---
4E, 4F:						
Berks--------------	Bedrock (lithic)	20-40	Very strongly cemented	Moderate	Low	High
Poplimento---------	---	---	---	Moderate	High	Moderate
5D, 5E, 5F:						
Berks--------------	Bedrock (lithic)	20-40	Very strongly cemented	Moderate	Low	High
Weikert------------	Bedrock (lithic)	10-20	Very strongly cemented	Moderate	Moderate	Moderate
6E:						
Bethesda-----------	---	---	---	Moderate	Moderate	High
Fairpoint----------	---	---	---	Moderate	High	Moderate
Sewell-------------	---	---	---	Moderate	Moderate	High
7C, 7D:						
Carbo--------------	Bedrock (lithic)	20-40	Indurated	Moderate	High	Low
8C, 8D, 8E:						
Carbo--------------	Bedrock (lithic)	20-40	Indurated	Moderate	High	Low
Beech Grove--------	Bedrock (lithic)	1-8	Indurated	Moderate	Moderate	Low
9C, 9D, 9E:						
Carbo--------------	Bedrock (lithic)	20-40	Indurated	Moderate	High	Low
Rock outcrop-------	Bedrock (lithic)	0-0	Indurated	---	---	---
10A:						
Chagrin------------	---	---	---	Moderate	Low	Moderate
Lobdell------------	---	---	---	High	Low	Moderate
11B, 11C:						
Escatawba----------	---	---	---	Moderate	High	Moderate
Jefferson----------	---	---	---	Moderate	Moderate	High

Table 19.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
12B, 12C, 12D, 12E, 12F, 13B, 13C, 13D, 13E, 13F, 14B, 14C, 14D, 14E:						
Frederick	---	---	---	Moderate	Moderate	High
15C, 15D, 15E, 15F:						
Frederick	---	---	---	Moderate	Moderate	High
Carbo	Bedrock (lithic)	20-40	Indurated	Moderate	High	Low
16C, 16D, 16E:						
Gilpin	Bedrock (paralithic)	20-40	Moderately cemented	Moderate	Low	High
17D, 17E, 17F:						
Gilpin	Bedrock (paralithic)	20-40	Moderately cemented	Moderate	Low	High
Berks	Bedrock (lithic)	20-40	Very strongly cemented	Moderate	Low	High
18A:						
Holly	---	---	---	High	High	Moderate
19E:						
Itmann	---	---	---	Moderate	High	High
20D:						
Jefferson	---	---	---	Moderate	Moderate	High
21A:						
Lobdell	---	---	---	High	Low	Moderate
Orrville	---	---	---	High	High	Moderate
22C, 22E:						
Oriskany	---	---	---	Moderate	Moderate	High
23A:						
Philo	---	---	---	High	Low	High
24D, 24E:						
Pineville	---	---	---	Moderate	Low	High
25.						
Pits						
26A:						
Pope	---	---	---	Moderate	Low	High
27D, 27E:						
Poplimento	---	---	---	Moderate	High	Moderate
Berks	Bedrock (lithic)	20-40	Very strongly cemented	Moderate	Low	High
28B, 28C, 28D:						
Shottower	---	---	---	Moderate	High	Moderate
29B, 29C:						
Timberville	---	---	---	Moderate	Low	High

Table 19.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
30C, 30D, 31C, 31D, 31E:						
Tumbling----------	---	---	---	Moderate	Moderate	Moderate
32. Udorthents						
33. Urban land-Udorthents						
34D, 34E:						
Wallen-------------	Bedrock (lithic)	20-40	Indurated	Moderate	Low	High
Alticrest----------	Bedrock (lithic)	20-40	Indurated	Moderate	Low	High
35F:						
Wallen-------------	Bedrock (lithic)	20-40	Indurated	Moderate	Low	High
Rock outcrop-------	Bedrock (lithic)	0-0	Indurated	---	---	---
36C, 36D, 36E:						
Watahala-----------	Strongly contrasting textural stratification	20-50	---	Moderate	High	High
Frederick----------	---	---	---	Moderate	Moderate	High
W. Water						

Table 20.—Classification of the Soils

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, semiactive, mesic Typic Hapludults
Alticrest	Coarse-loamy, siliceous, semiactive, mesic Typic Dystrudepts
Beech Grove	Loamy, mixed, superactive, nonacid, mesic Lithic Udorthents
Berks	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
Bethesda	Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents
Carbo	Very fine, mixed, active, mesic Typic Hapludalfs
Chagrin	Fine-loamy, mixed, active, mesic Dystric Fluventic Eutrudepts
Escatawba	Fine-loamy, siliceous, semiactive, mesic Oxyaquic Paleudults
Fairpoint	Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents
Frederick	Fine, mixed, semiactive, mesic Typic Paleudults
Gilpin	Fine-loamy, mixed, active, mesic Typic Hapludults
Holly	Fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts
Itmann	Loamy-skeletal, mixed, semiactive, acid, mesic Typic Udorthents
Jefferson	Fine-loamy, siliceous, semiactive, mesic Typic Hapludults
Lobdell	Fine-loamy, mixed, active, mesic Fluvaquentic Eutrudepts
Oriskany	Loamy-skeletal, siliceous, semiactive, mesic Typic Hapludults
Orrville	Fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts
Philo	Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts
Pineville	Fine-loamy, mixed, active, mesic Typic Hapludults
Pope	Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts
Poplimento	Fine, mixed, subactive, mesic Ultic Hapludalfs
Sewell	Loamy-skeletal, mixed, semiactive, acid, mesic Typic Udorthents
Shottower	Fine, kaolinitic, mesic Typic Paleudults
Timberville	Fine, mixed, active, mesic Typic Hapludults
Tumbling	Fine, kaolinitic, mesic Typic Paleudults
Udorthents	Udorthents
Wallen	Loamy-skeletal, siliceous, active, mesic Typic Dystrudepts
Watahala	Fine-loamy over clayey, siliceous over mixed, subactive, mesic Typic Paleudults
Weikert	Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts

Table 21.—Relationship of Geology to Soils

System	Geology	Dominant soils or miscellaneous areas
Pennsylvanian	Harlan Formation	Gilpin, Berks, Wallen, Bethesda
	Wise Formation Norton Formation	Gilpin, Berks, Alticrest, Bethesda
	Lee Formation	Wallen, Gilpin, Rock outcrop
Mississippian	Bluestone Formation	Berks, Poplimento
	Princeton Sandstone	Berks, Wallen
	Hinton Formation Bluefield Formation	Berks, Poplimento
	Greenbrier Limestone	Berks, Poplimento, Carbo
	Maccrady Shale	Berks, Weikert, Poplimento
	Price Formation	Wallen, Alticrest
Devonian	Chattanooga Shale	Berks, Weikert
Silurian	Hancock Limestone	Carbo, Gilpin
	Clinton Formation	Gilpin
	Clinch Sandstone:	
	Poor Valley Ridge Member	Wallen, Alticrest
	Hagan Shale Member	Berks, Weikert
Ordovician	Sequatchie Formation	Berks, Weikert, Poplimento
	Reedsville Shale	Berks, Poplimento
	Trenton Limestone Eggleston Formation Hardy Creek Limestone Ben Hur Limestone Woodway Limestone	Carbo, Beech Grove, Poplimento
	Hurricane Bridge Limestone	Beech Grove, Rock outcrop
	Martin Creek Limestone Rob Camp Limestone Poteet Limestone	Carbo, Frederick
	Dot Formation Mascot Dolomite Kingsport Dolomite Chepultepec Dolomite	Frederick, Watahala
Cambrian	Copper Ridge Dolomite	Frederick, Watahala
	Maynardville Formation	Frederick, Watahala, Carbo
	Nolichucky Shale Maryville Limestone Rogersville Shale Rutledge Limestone Pumpkin Valley Shale Rome Formation	Berks, Weikert, Poplimento
Quaternary	Surficial deposits:	
	Colluvium from limestone	Timberville
	Colluvium from sandstone and shale	Tumbling, Jefferson, Escatawba, Oriskany, Pineville
	Alluvium on floodplains	Holly, Orrville, Lobdell, Chagrin, Philo, Pope
	Alluvium on low terraces	Allegheny
	Alluvium on high terraces	Shottower

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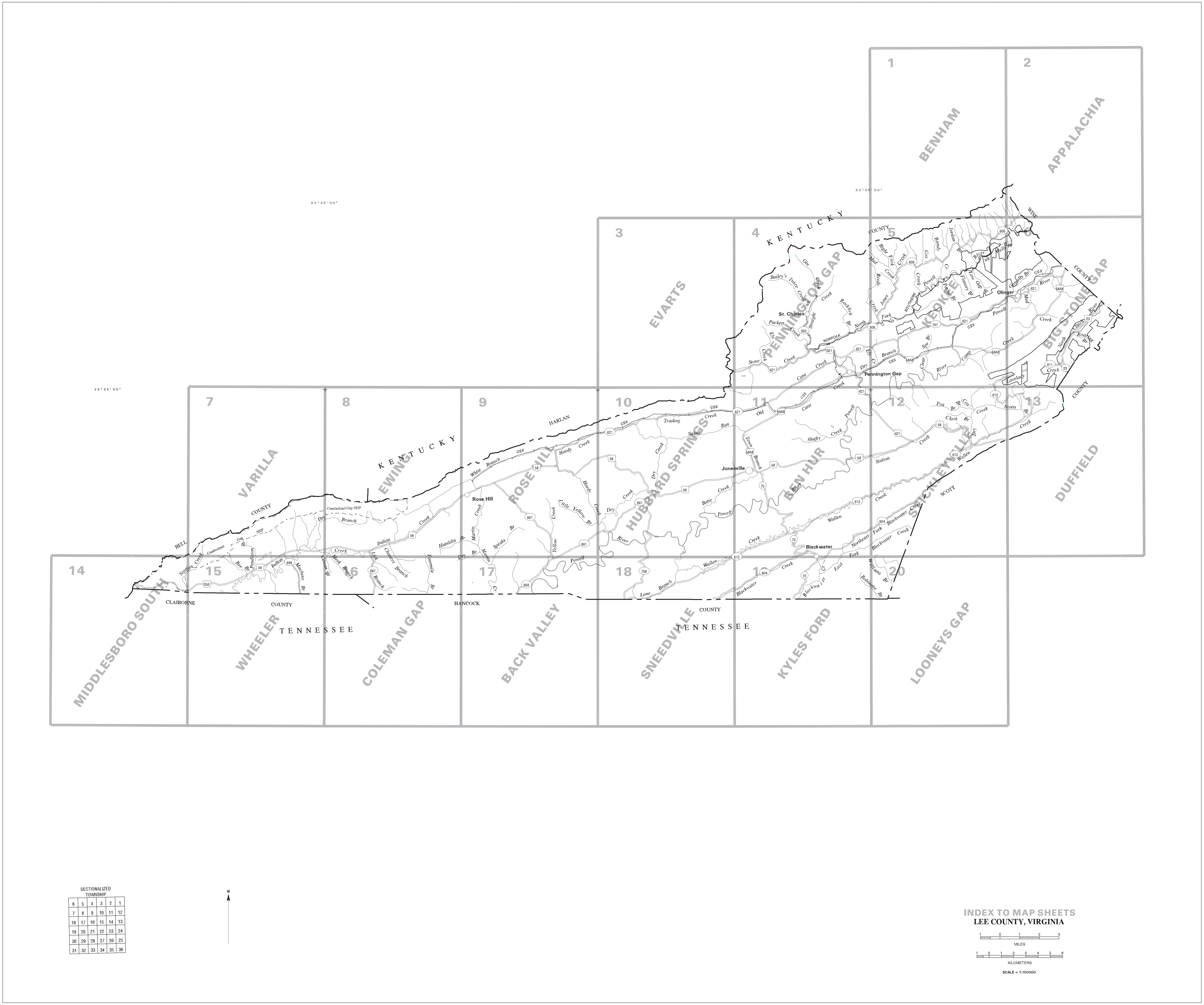


INDEX TO MAP SHEETS
LEE COUNTY, VIRGINIA

SOIL LEGEND

Map symbols consist of a combination of numbers and letters. The numbers are listed numerically and represent the kind of soil or soils in the map unit. A capital letter indicates the slope class. Miscellaneous areas are the only map units that are not represented by both a letter and a number.

SYMBOL	NAME
1A	Allegheny loam, 0 to 2 percent slopes, rarely flooded
1B	Allegheny loam, 2 to 7 percent slopes, rarely flooded
2D	Alticrest-Gilpin complex, 15 to 35 percent slopes
3E	Beech Grove-Rock outcrop complex, 3 to 60 percent slopes
4E	Berks-Poplimento complex, 35 to 55 percent slopes
4F	Berks-Poplimento complex, 55 to 65 percent slopes
5D	Berks-Weikert complex, 15 to 35 percent slopes
5E	Berks-Weikert complex, 35 to 55 percent slopes
5F	Berks-Weikert complex, 55 to 80 percent slopes
6E	Bethesda, Fairpoint, and Sewell soils, 0 to 80 percent slopes, very rocky
7C	Carbo silt loam, 7 to 15 percent slopes
7D	Carbo silt loam, 15 to 25 percent slopes
8C	Carbo-Beech Grove complex, 7 to 15 percent slopes, rocky
8D	Carbo-Beech Grove complex, 15 to 25 percent slopes, rocky
8E	Carbo-Beech Grove complex, 25 to 60 percent slopes, rocky
9C	Carbo-Rock outcrop complex, 7 to 15 percent slopes
9D	Carbo-Rock outcrop complex, 15 to 25 percent slopes
9E	Carbo-Rock outcrop complex, 25 to 35 percent slopes
10A	Chagrin-Lobdell complex, 0 to 3 percent slopes, occasionally flooded
11B	Escatawba-Jefferson complex, 2 to 7 percent slopes
11C	Escatawba-Jefferson complex, 7 to 15 percent slopes
12B	Frederick gravelly loam, 2 to 7 percent slopes
12C	Frederick gravelly loam, 7 to 15 percent slopes
12D	Frederick gravelly loam, 15 to 25 percent slopes
12E	Frederick gravelly loam, 25 to 35 percent slopes
12F	Frederick gravelly loam, 35 to 60 percent slopes
13B	Frederick silt loam, 2 to 7 percent slopes
13C	Frederick silt loam, 7 to 15 percent slopes
13D	Frederick silt loam, 15 to 25 percent slopes
13E	Frederick silt loam, 25 to 35 percent slopes
13F	Frederick silt loam, 35 to 60 percent slopes
14B	Frederick silt loam, karst, 2 to 7 percent slopes
14C	Frederick silt loam, karst, 7 to 15 percent slopes
14D	Frederick silt loam, karst, 15 to 25 percent slopes
14E	Frederick silt loam, karst, 25 to 60 percent slopes
15C	Frederick-Carbo complex, 7 to 15 percent slopes, rocky
15D	Frederick-Carbo complex, 15 to 25 percent slopes, rocky
15E	Frederick-Carbo complex, 25 to 35 percent slopes, rocky
15F	Frederick-Carbo complex, 35 to 60 percent slopes, rocky
16C	Gilpin silt loam, 7 to 15 percent slopes
16D	Gilpin silt loam, 15 to 35 percent slopes
16E	Gilpin silt loam, 35 to 55 percent slopes
17D	Gilpin-Berks complex, 15 to 35 percent slopes
17E	Gilpin-Berks complex, 35 to 55 percent slopes
17F	Gilpin-Berks complex, 55 to 70 percent slopes
18A	Holly loam, 0 to 2 percent slopes, frequently flooded
19E	Itmann extremely channery sandy loam, 0 to 80 percent slopes
20D	Jefferson loam, 15 to 35 percent slopes, very stony
21A	Lobdell-Orrville complex, 0 to 3 percent slopes, occasionally flooded
22C	Oriskany cobbly loam, 7 to 15 percent slopes, extremely stony
22E	Oriskany cobbly loam, 35 to 55 percent slopes, extremely stony
23A	Philo fine sandy loam, 0 to 3 percent slopes, occasionally flooded
24D	Pineville channery loam, 15 to 35 percent slopes, very stony
24E	Pineville channery loam, 35 to 55 percent slopes, very stony
25	Pits, quarries
26A	Pope fine sandy loam, 0 to 3 percent slopes, occasionally flooded
27D	Poplimento-Berks complex, 15 to 35 percent slopes
27E	Poplimento-Berks complex, 35 to 55 percent slopes
28B	Shottower silt loam, 2 to 7 percent slopes
28C	Shottower silt loam, 7 to 15 percent slopes
28D	Shottower silt loam, 15 to 25 percent slopes
29B	Timberville silt loam, 2 to 7 percent slopes, frequently flooded
29C	Timberville silt loam, 7 to 15 percent slopes
30C	Tumbling loam, 7 to 15 percent slopes
30D	Tumbling loam, 15 to 25 percent slopes
31C	Tumbling loam, 7 to 15 percent slopes, very stony
31D	Tumbling loam, 15 to 25 percent slopes, very stony
31E	Tumbling loam, 25 to 35 percent slopes, very stony
32	Udorthents
33	Urban land-Udorthents complex
34D	Wallen-Alticrest complex, 15 to 35 percent slopes, very stony
34E	Wallen-Alticrest complex, 35 to 55 percent slopes, very stony
35F	Wallen-Rock outcrop complex, 35 to 85 percent slopes, very stony
36C	Watahala-Frederick complex, 7 to 15 percent slopes
36D	Watahala-Frederick complex, 15 to 35 percent slopes
36E	Watahala-Frederick complex, 35 to 55 percent slopes
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

County or parish

Reservation (national forest or park, state forest or park)

Field sheet matchline & neatline

STATE COORDINATE TICK
1 890 000 FEET

GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

Divided roads

Other roads

ROAD EMBLEM & DESIGNATIONS

Federal 287 410 224

State 52 52 347

County, farm or ranch 1283

HYDROGRAPHIC FEATURES

STREAMS

Perennial, double line

Unclassified

Drainage end
(Indicates direction of flow)

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS 14C 16C

LANDFORM FEATURES

ESCARPMENTS

Bedrock

Gully

Sinkhole

EXCAVATIONS

Mine or quarry

MISCELLANEOUS SURFACE FEATURES

Gravelly spot

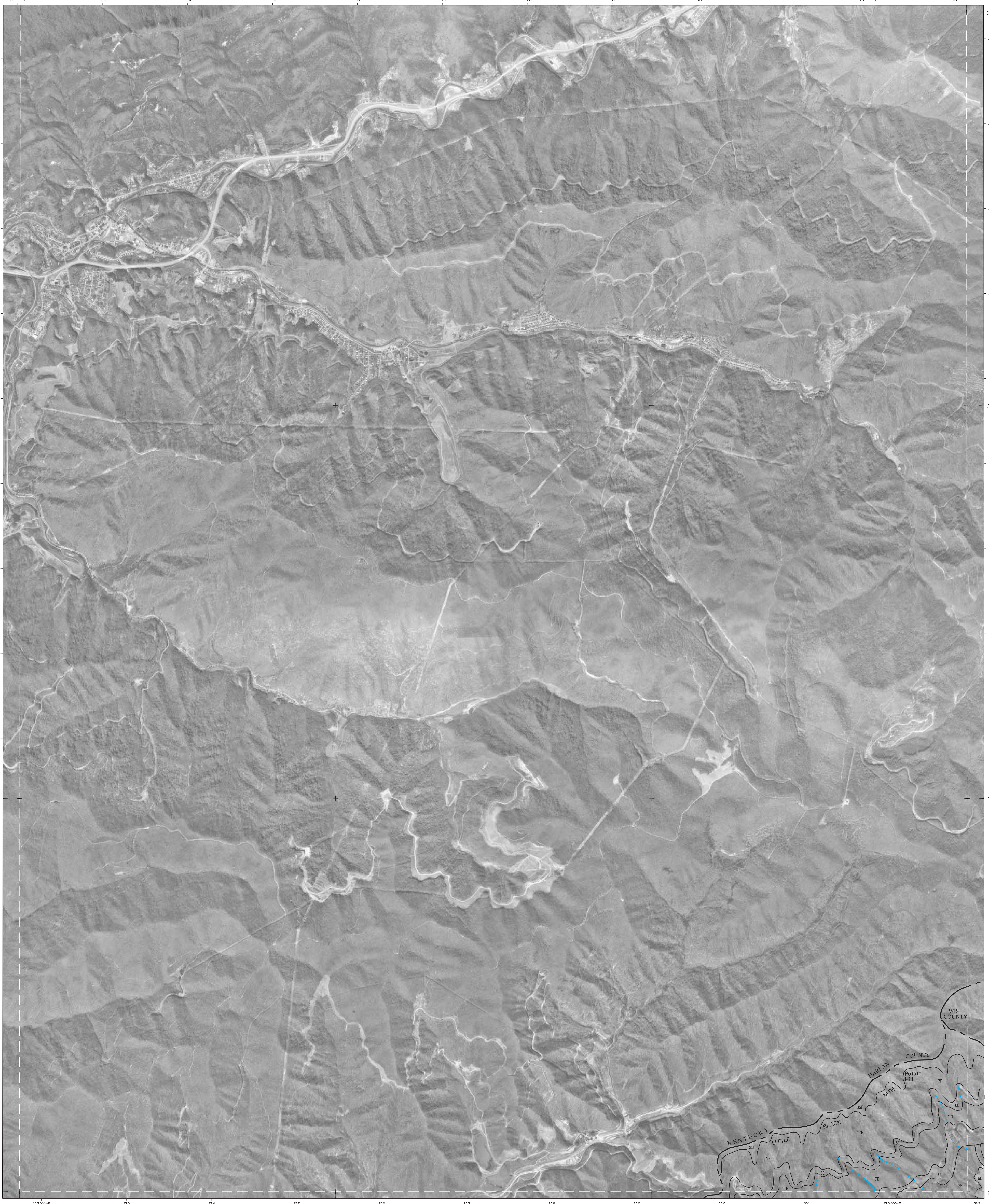
Rock outcrop (includes sandstone and shale)

Severely eroded spot

Stony spot

Very stony spot

Wet spot



Joins sheet 4, Pennington Gap

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 17.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	■	2
4	5	6

2 APPALACHIA
4 PENNINGTON GAP
5 KEOKEE
6 BIG STONE GAP

INDEX TO ADJOINING 7.5 MAPS

BENHAM, VIRGINIA

7.5 MINUTE SERIES
SHEET NUMBER 1 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 6, Big Stone Gap

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

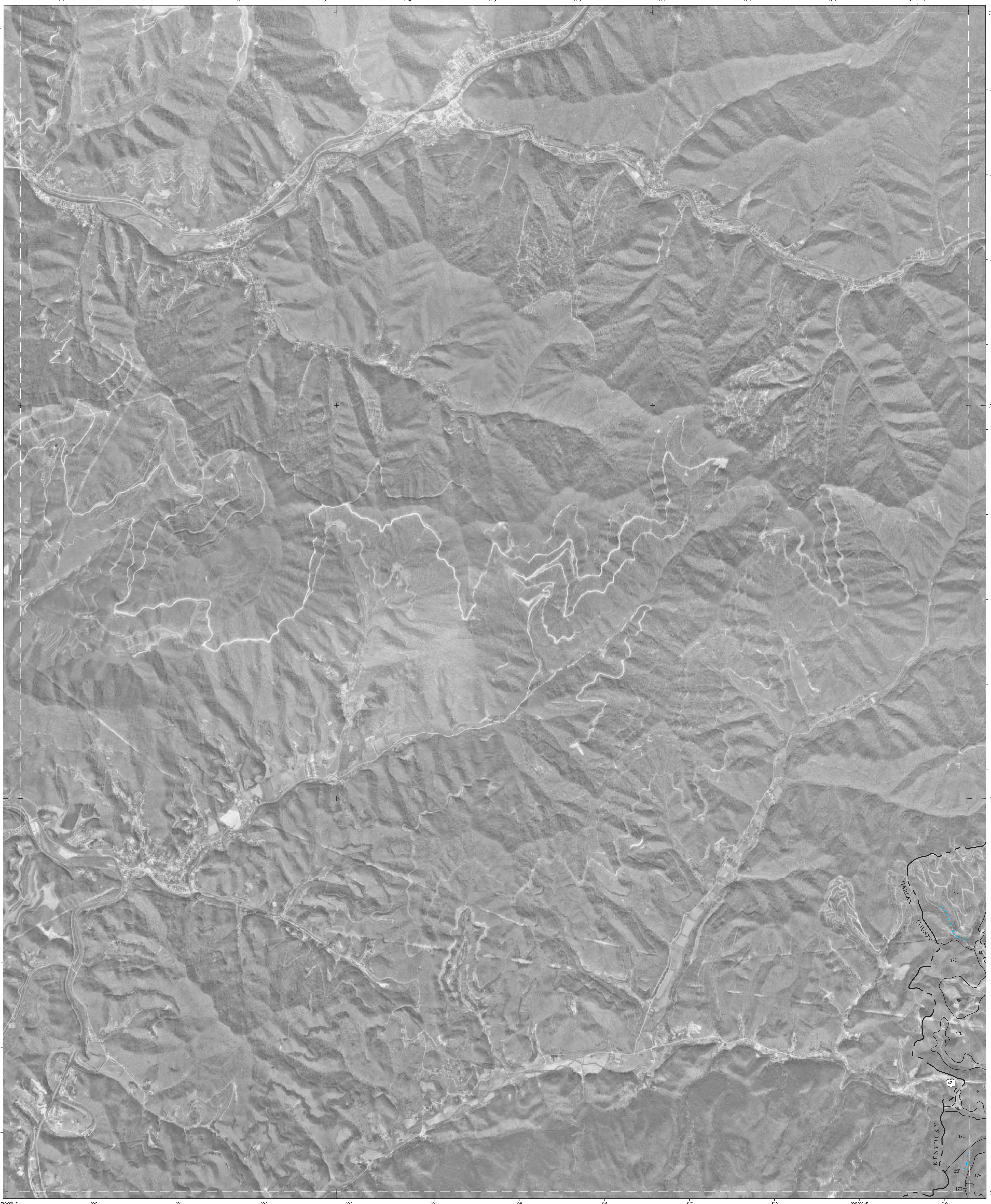
1 BENHAM
5 KEOKEE
6 BIG STONE GAP
INDEX TO ADJOINING 7.5 MAPS

APPALACHIA, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
EVARTS QUADRANGLE
SHEET NUMBER 3 OF 20



Joins sheet 9, Rose Hill

Joins sheet 11, Ben Hur

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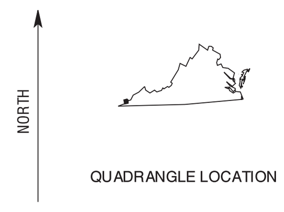
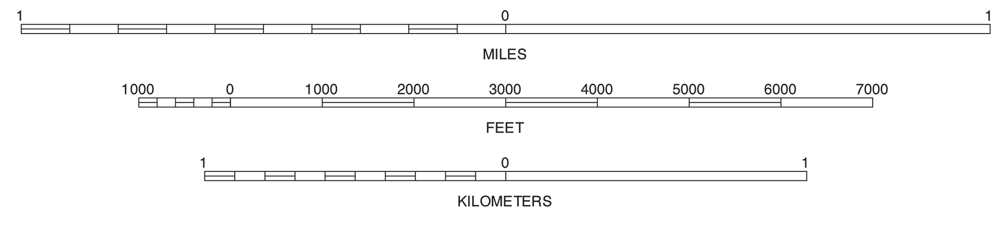
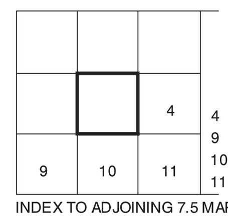


QUADRANGLE LOCATION

SCALE 1:24000





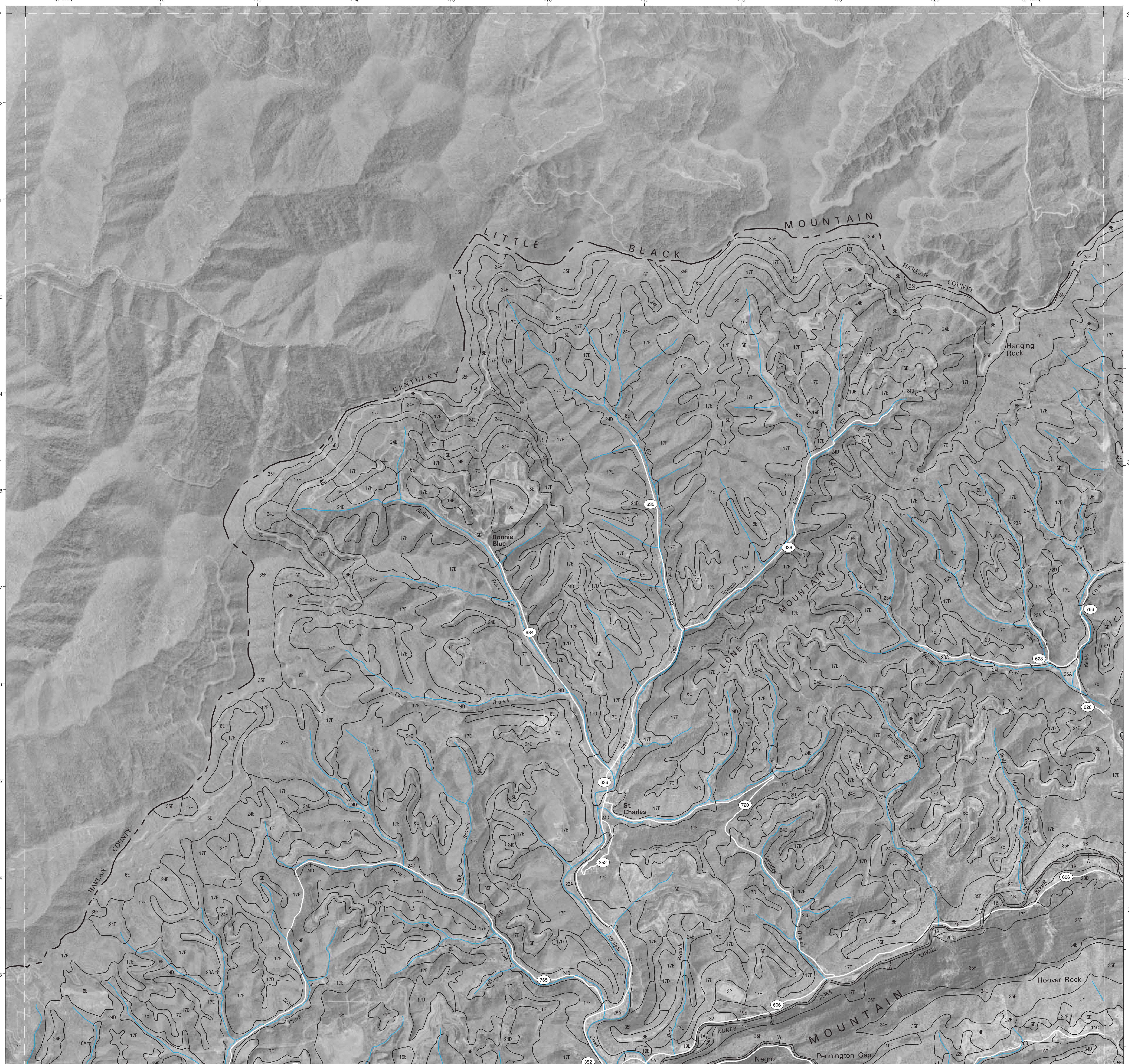
4 PENNINGTON GAP
9 ROSE HILL
10 HUBBARD SPRINGS
11 BEN HUR

INDEX TO ADJOINING 7.5 MAPS

EVARTS, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 1, Benham



Joins sheet 3, Evarts

Joins sheet 5, Keokee

Joins sheet 10, Hubbard Springs

Joins sheet 11, Ben Hur

Joins sheet 12, Stickleyville

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

		1
3		5
10	11	12

1 BENHAM
3 EVARTS
5 KEOKEE
10 HUBBARD SPRINGS
11 BEN HUR
12 STICKLEYVILLE

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PENNINGTON GAP, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 20

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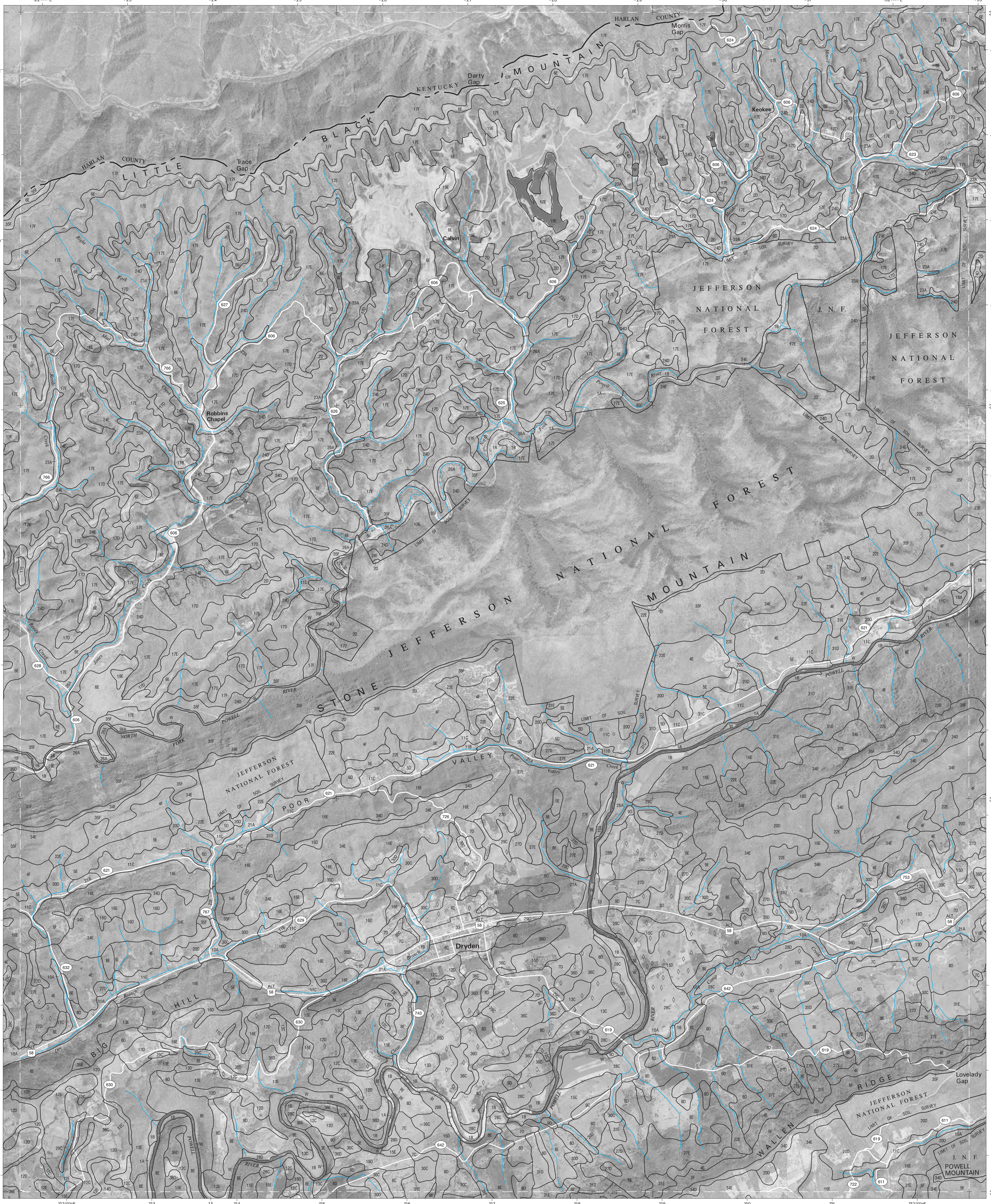
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
KEOKEE QUADRANGLE
SHEET NUMBER 5 OF 20

Joins sheet 1, Benham

Joins sheet 2, Appalachia



Joins sheet 4, Pennington Gap

Joins sheet 6, Big Stone Gap

Joins sheet 11, Ben Hur

Joins sheet 12, Stickleyville

Joins sheet 13, Duffield

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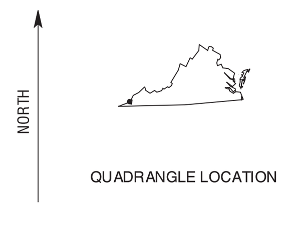

QUADRANGLE LOCATION

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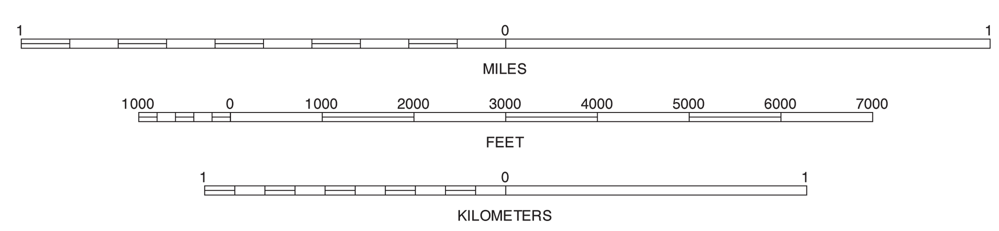


	1	2
4		6
11	12	13

1 BENHAM
2 APPALACHIA
4 PENNINGTON GAP
6 BIG STONE GAP
11 BEN HUR
12 STICKLEYVILLE
13 DUFFIELD

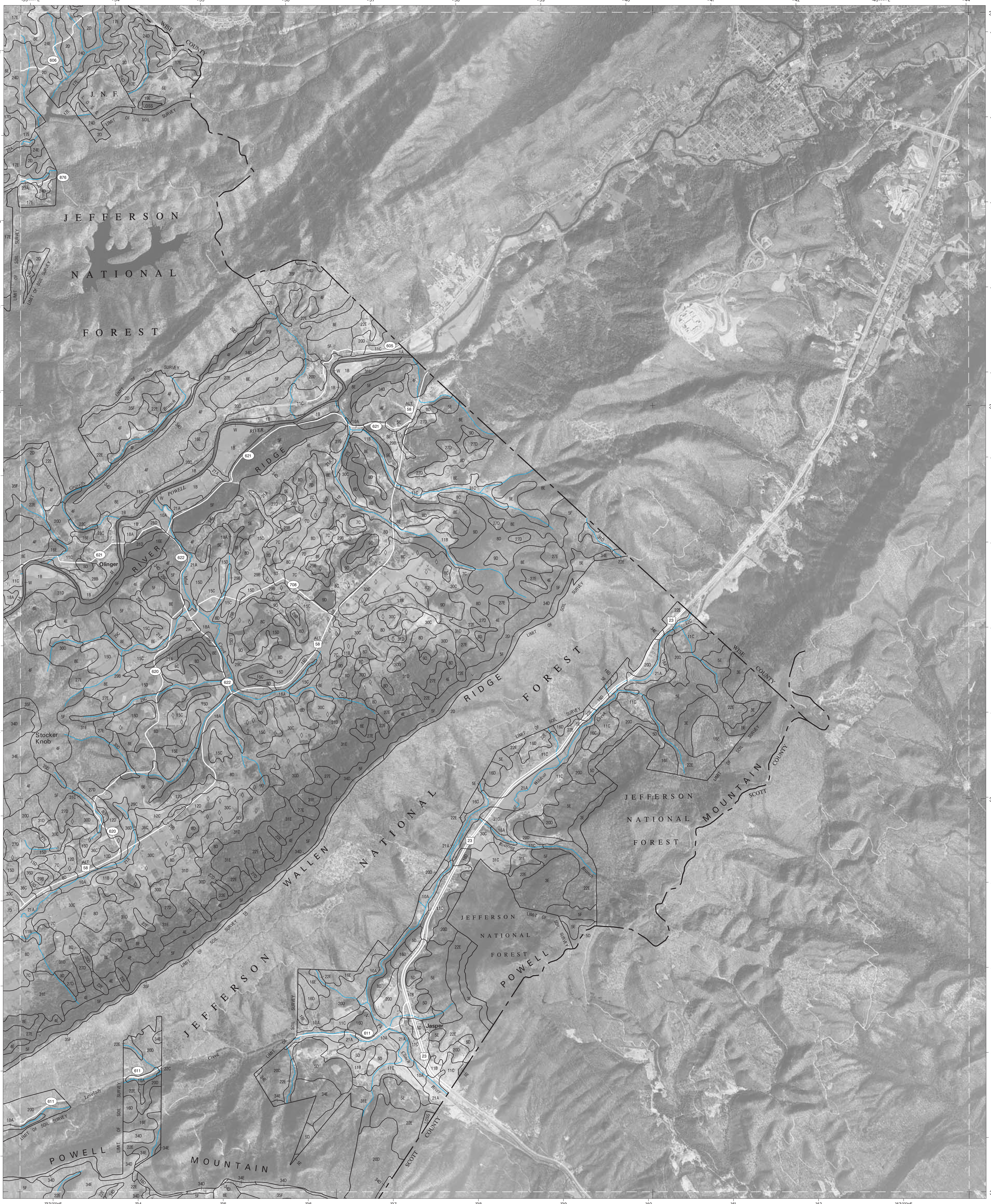
INDEX TO ADJOINING 7.5 MAPS

KEOKEE, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
BIG STONE GAP QUADRANGLE
SHEET NUMBER 6 OF 20



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

1 BENHAM
2 APPALACHIA
5 KEOKEE
12 STICKLEYVILLE
13 DUFFIELD

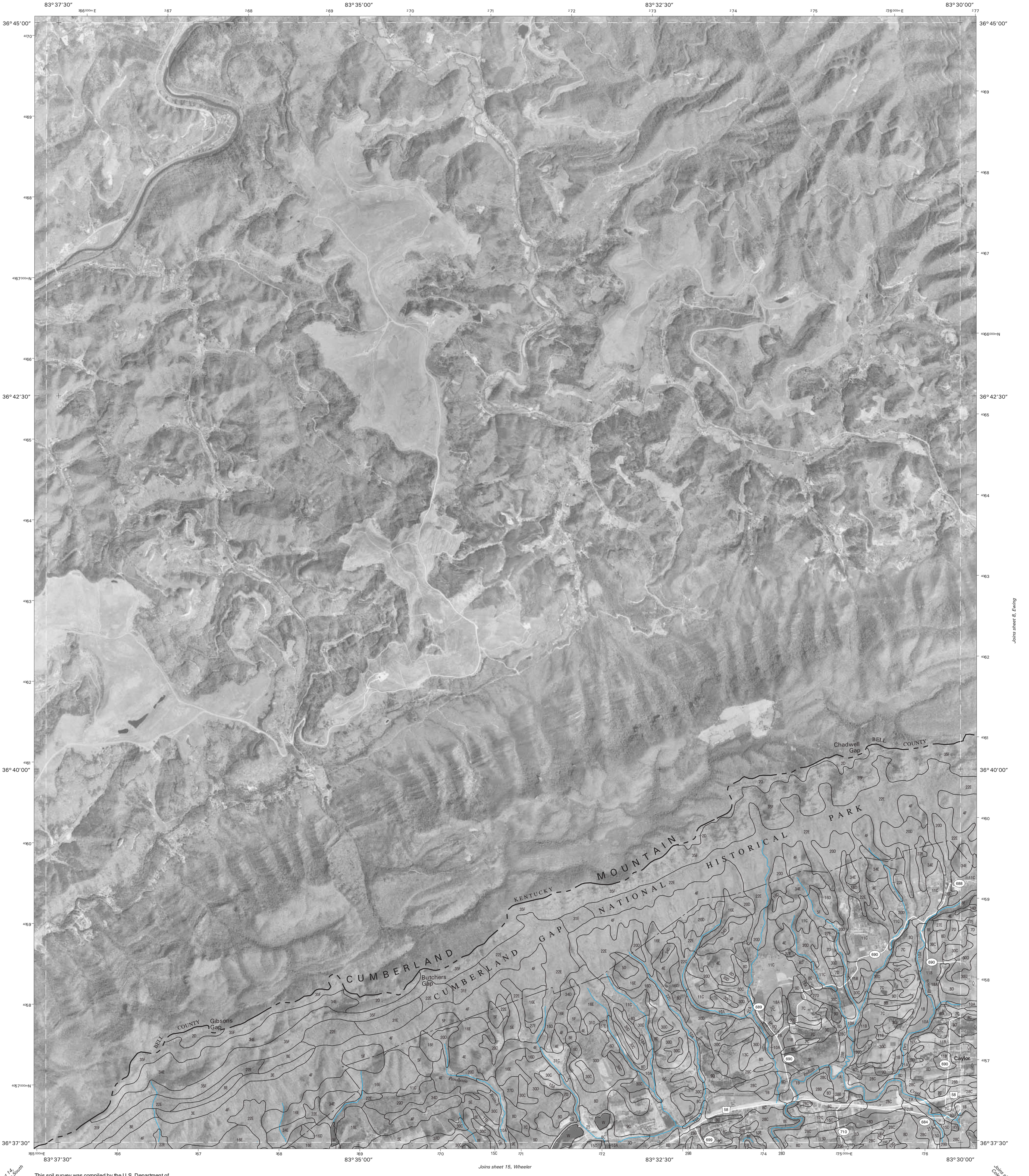
INDEX TO ADJOINING 7.5 MAPS

BIG STONE GAP, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
VARILLA QUADRANGLE (OVERSIZED)
SHEET NUMBER 7 OF 20



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

8 EWING
14 MIDDLESBORO SOUTH
15 WHEELER
16 COLEMAN GAP

INDEX TO ADJOINING 7.5 MAPS

VARILLA, (OVERSIZED) VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 20

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
EWING QUADRANGLE
SHEET NUMBER 8 OF 20

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

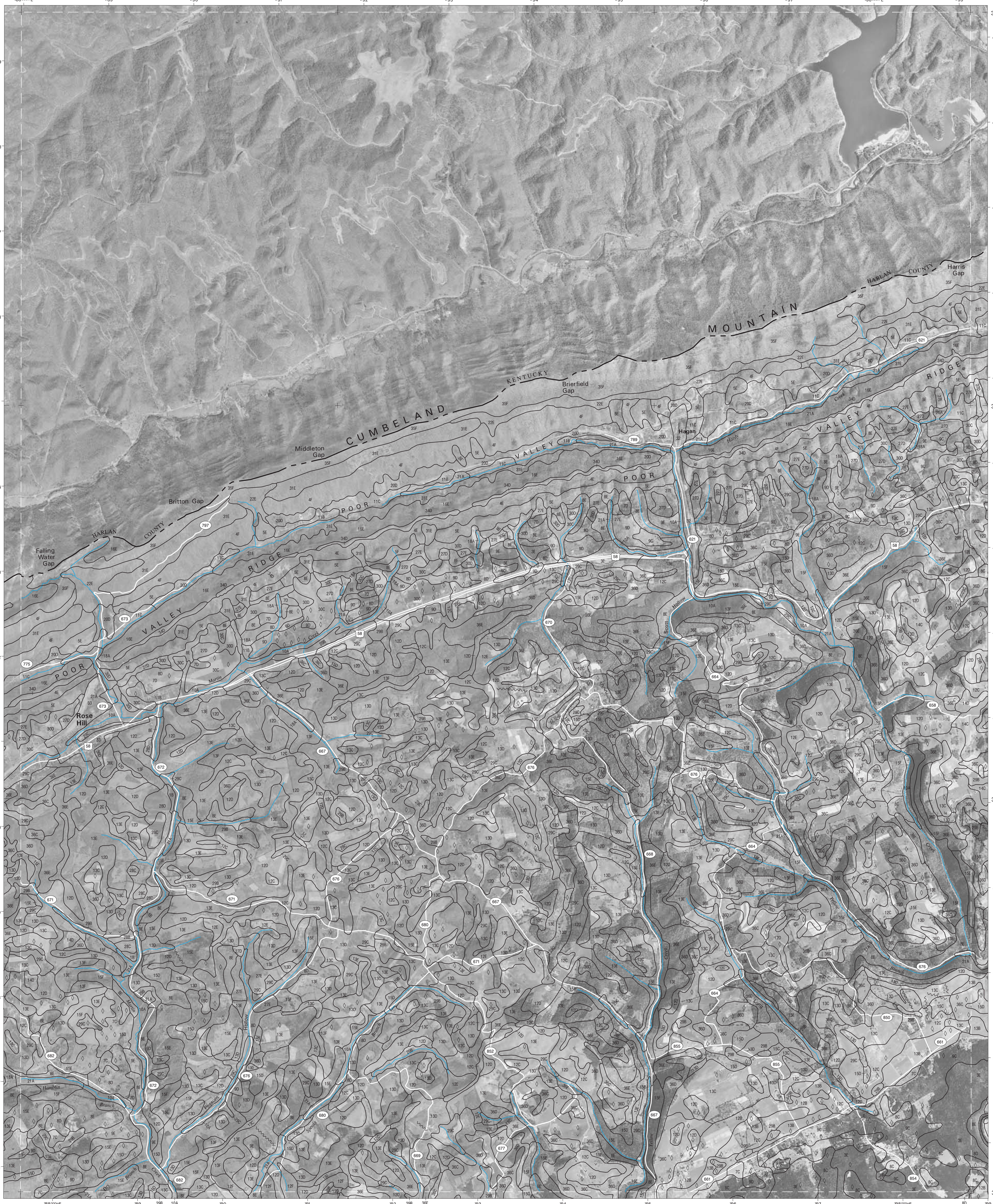
7 VARILLA
9 ROSE HILL
15 WHEELER
16 COLEMAN GAP
17 BACK VALLEY

INDEX TO ADJOINING 7.5 MAPS

EWING, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 3, Evarts



Joins sheet 8, Ewing

Joins sheet 10, Hubbard Springs

Joins sheet 17, Back Valley

Joins sheet 16, Coleman Gap

Joins sheet 18, Sneedville

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

3 EVARTS
8 EWING
10 HUBBARD SPRINGS
16 COLEMAN GAP
17 BACK VALLEY
18 SNEEDVILLE

INDEX TO ADJOINING 7.5 MAPS

ROSE HILL, VIRGINIA

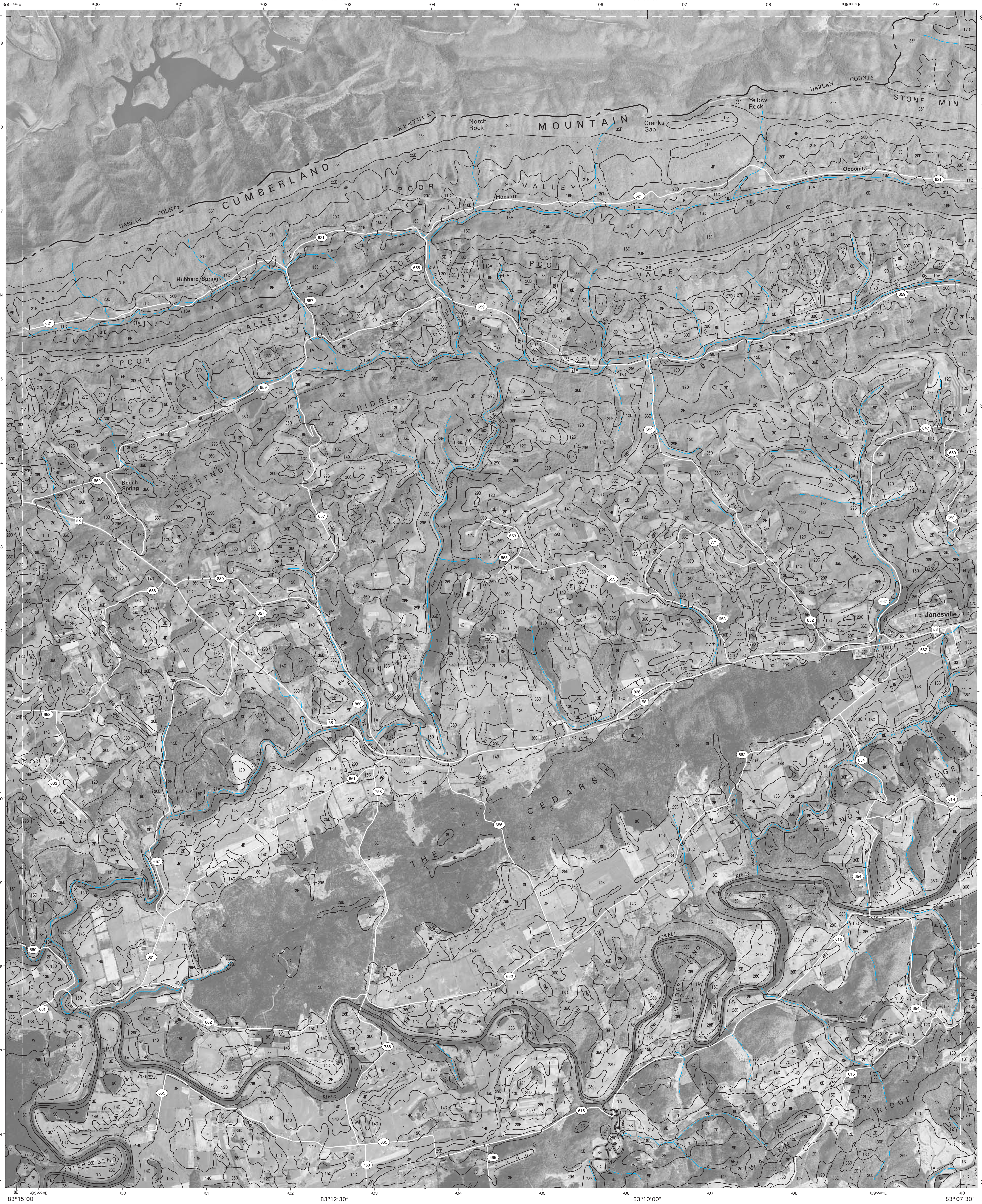
7.5 MINUTE SERIES

SHEET NUMBER 9 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 3, Evarts

Joins sheet 4, Pennington Gap



Joins sheet 9, Rose Hill

Joins sheet 11, Ben Hur

Joins sheet 17, Back Valley

Joins sheet 18, Sneedville

Joins sheet 19, Kyles Ford

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES: 1 0 1

FEET: 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS: 1 0 1

	3	4
9		11
17	18	19

INDEX TO ADJOINING 7.5 MAPS

3 EVARTS
4 PENNINGTON GAP
9 ROSE HILL
11 BEN HUR
17 BACK VALLEY
18 SNEEDVILLE
19 KYLES FORD

HUBBARD SPRINGS, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

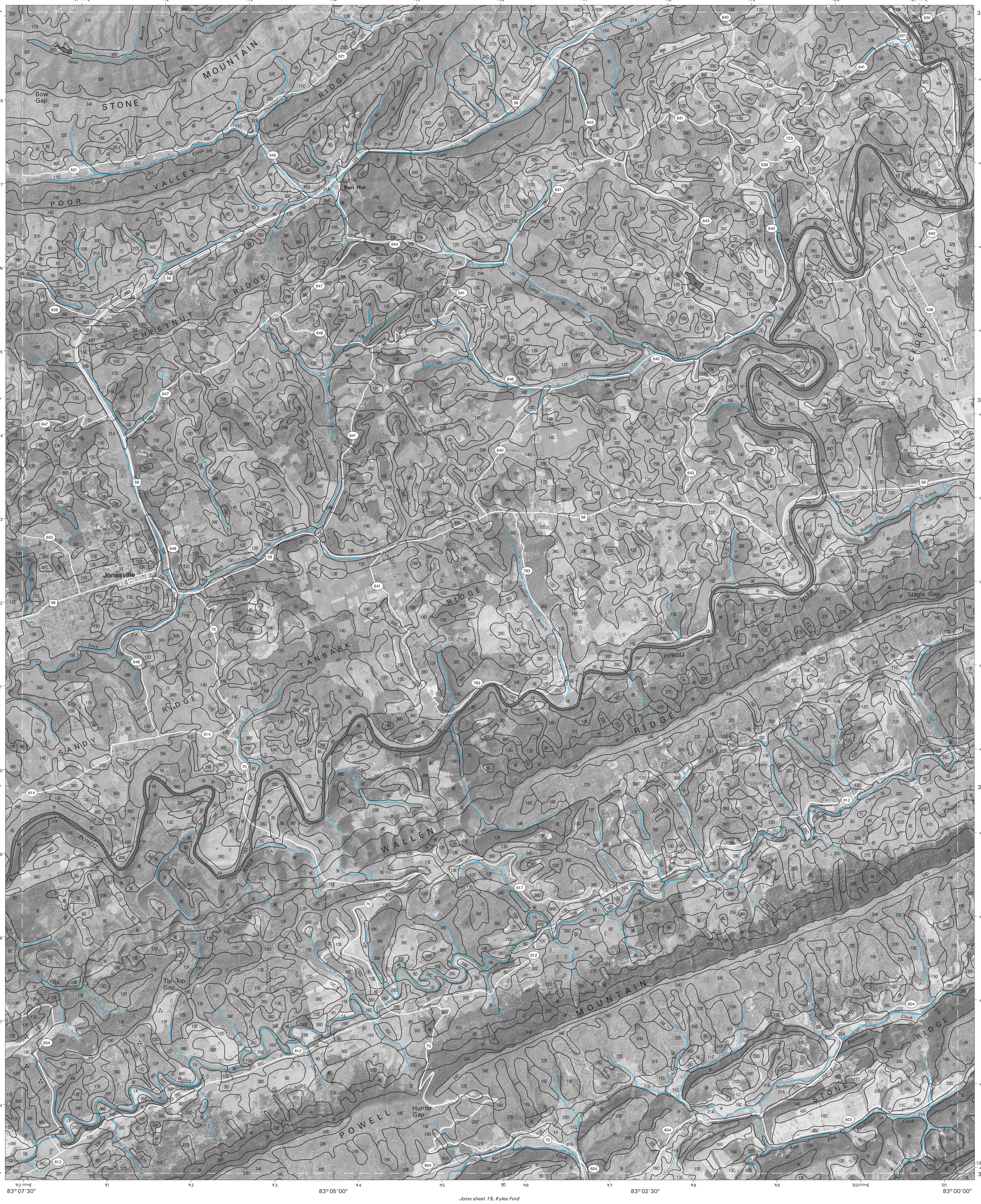
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
BEN HUR QUADRANGLE
SHEET NUMBER 11 OF 20

Joins sheet 3, Evarts

Joins sheet 4, Pennington Gap

Joins sheet 5, Keokee



Joins sheet 10, Hubbard Springs

Joins sheet 12, Stickleyville

Joins sheet 18, Sneedville

Joins sheet 19, Kyles Ford

Joins sheet 20, Looneys Gap

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

3	4	5
10		12
18	19	20

3 EVARTS
4 PENNINGTON GAP
5 KEOKEE
10 HUBBARD SPRINGS
12 STICKLEYVILLE
18 SNEEDVILLE
19 KYLES FORD
20 LOONEYS GAP

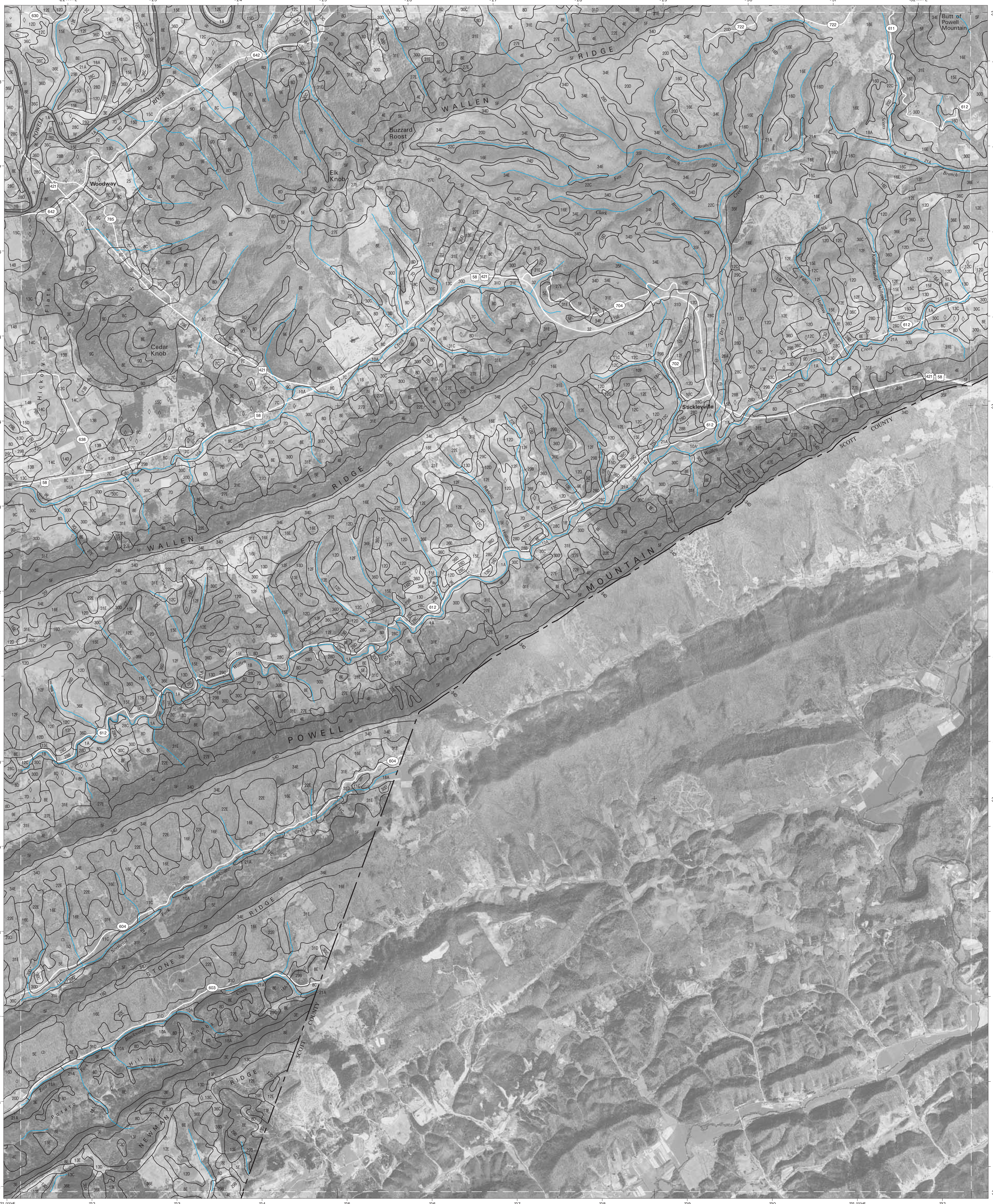
INDEX TO ADJOINING 7.5 MAPS

BEN HUR, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
STICKLEYVILLE QUADRANGLE
SHEET NUMBER 12 OF 20



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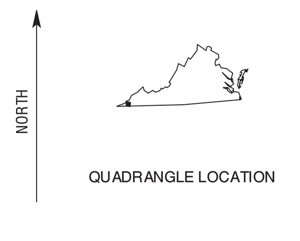
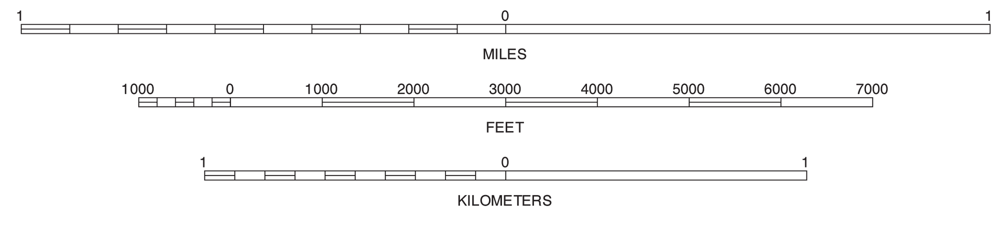


QUADRANGLE LOCATION

SCALE 1:24000



4	5	6
11		13
19	20	

4 PENNINGTON GAP
5 KEOKEE
6 BIG STONE GAP
11 BEN HUR
13 DUFFIELD
19 KYLES FORD
20 LOONEYS GAP

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STICKLEYVILLE, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 20

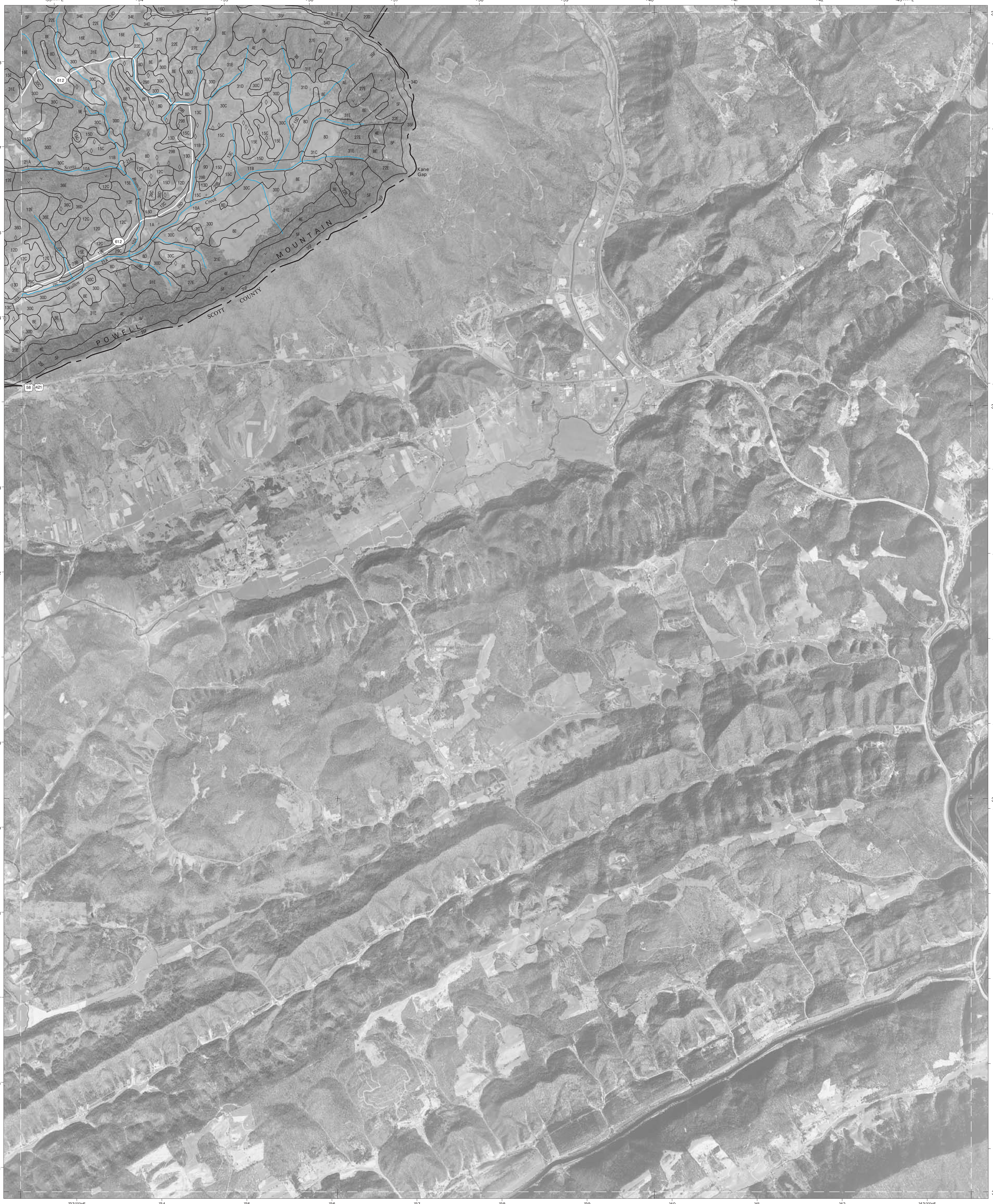
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 5, Keokee

Joins sheet 6, Big Stone Gap

Joins sheet 12, Stickleyville

Joins sheet 20, Looneys Gap



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

5	6	
12		
20		

5 KEOKEE
6 BIG STONE GAP
12 STICKLEYVILLE
20 LOONEYS GAP

INDEX TO ADJOINING 7.5 MAPS

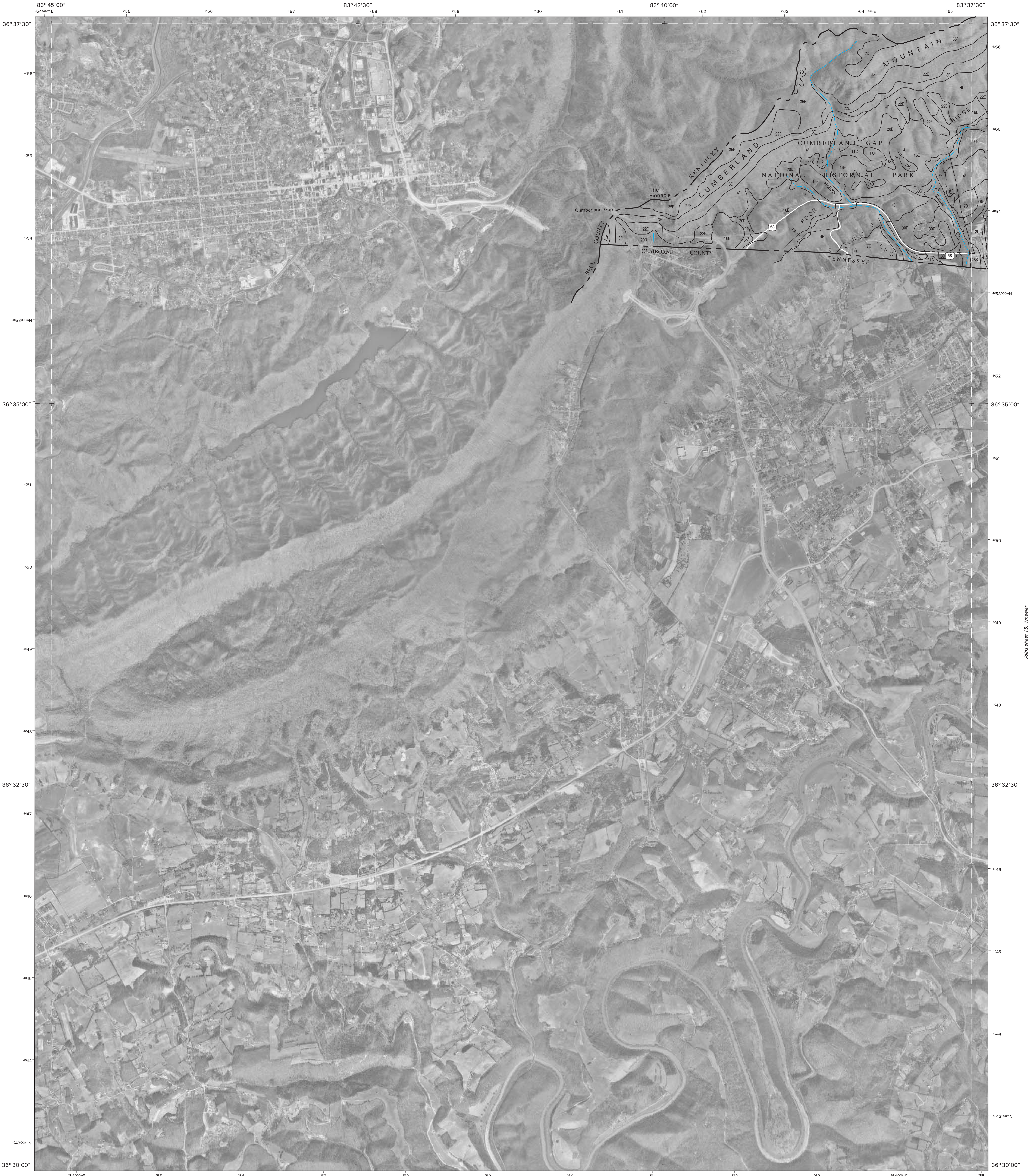
DUFFIELD, VIRGINIA

7.5 MINUTE SERIES
SHEET NUMBER 13 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
MIDDLESBORO SOUTH QUADRANGLE
SHEET NUMBER 14 OF 20



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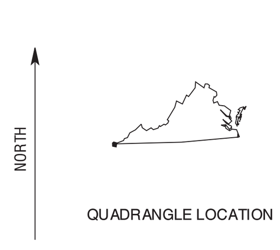
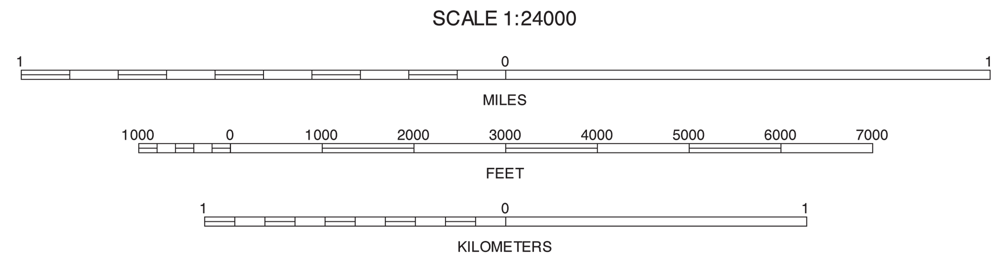
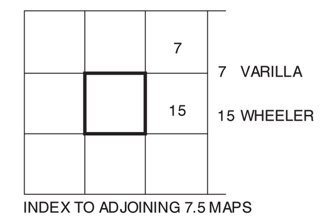


QUADRANGLE LOCATION

SCALE 1:24000





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MIDDLESBORO SOUTH, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 20

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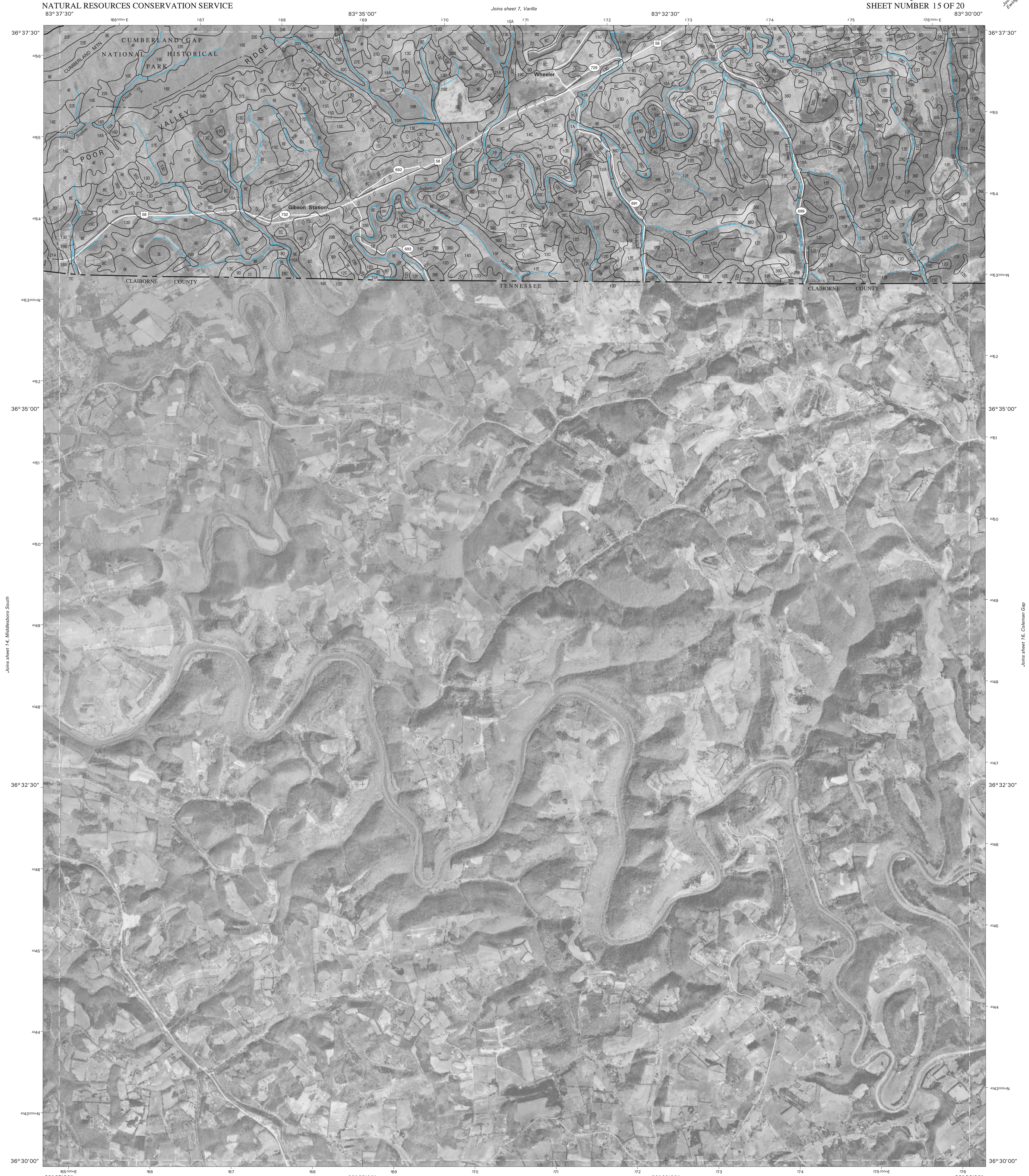
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
WHEELER QUADRANGLE
SHEET NUMBER 15 OF 20



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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 17.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	7	8
14		16

7 VARILLA
8 EWING
14 MIDDLESBORO SOUTH
16 COLEMAN GAP

INDEX TO ADJOINING 7.5 MAPS

WHEELER, VIRGINIA
7.5 MINUTE SERIES
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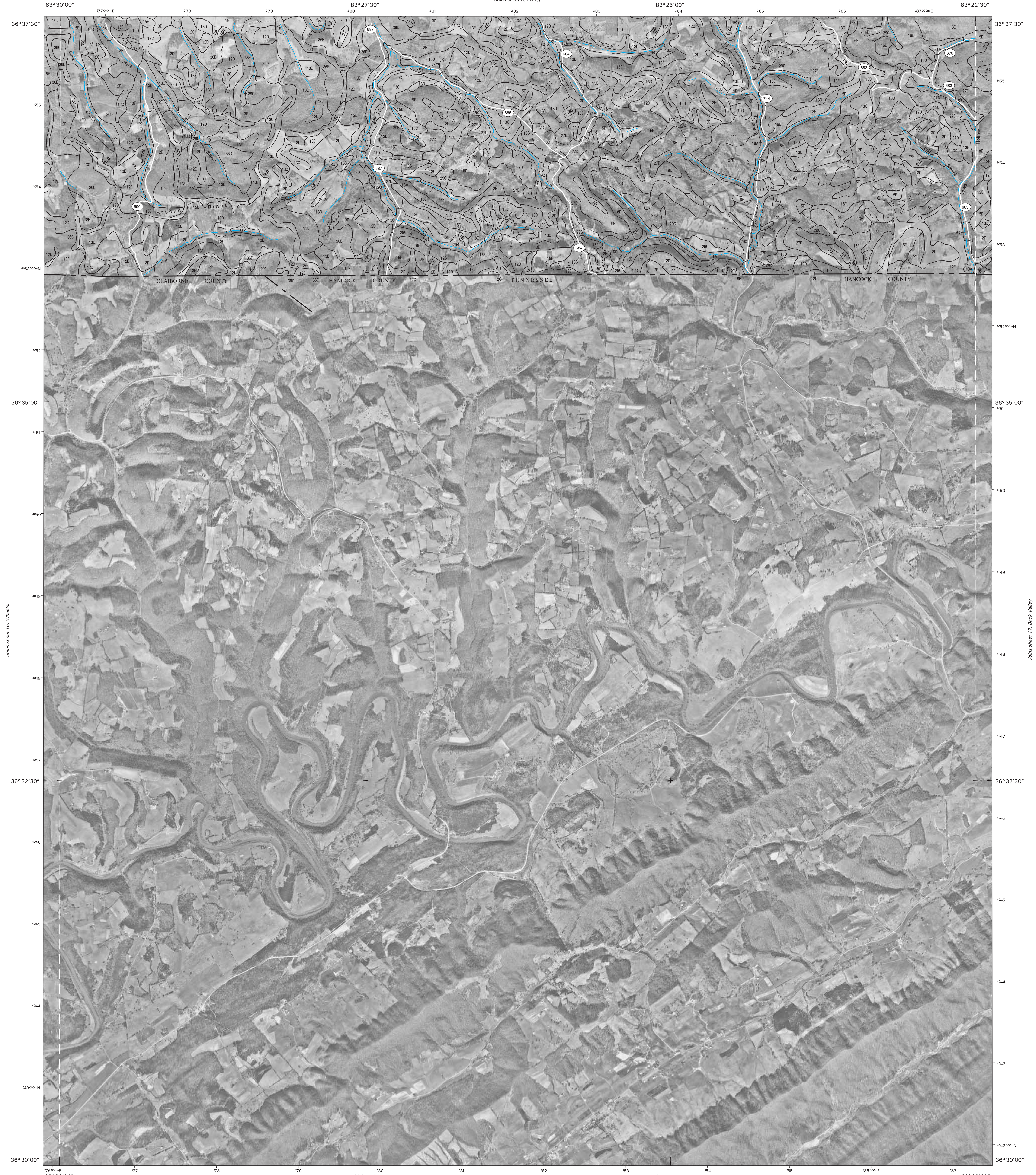
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
COLEMAN GAP QUADRANGLE
SHEET NUMBER 16 OF 20



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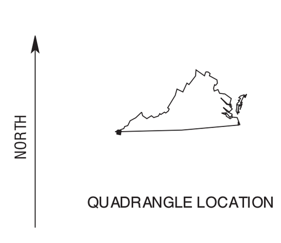

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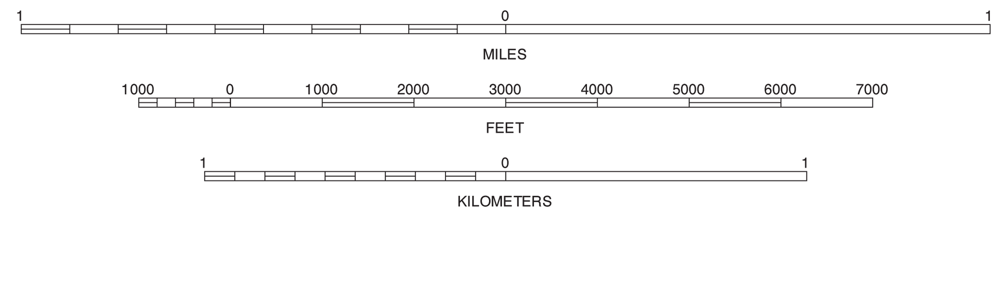

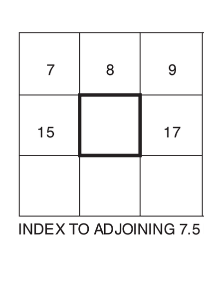

COLEMAN GAP, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 16 OF 20

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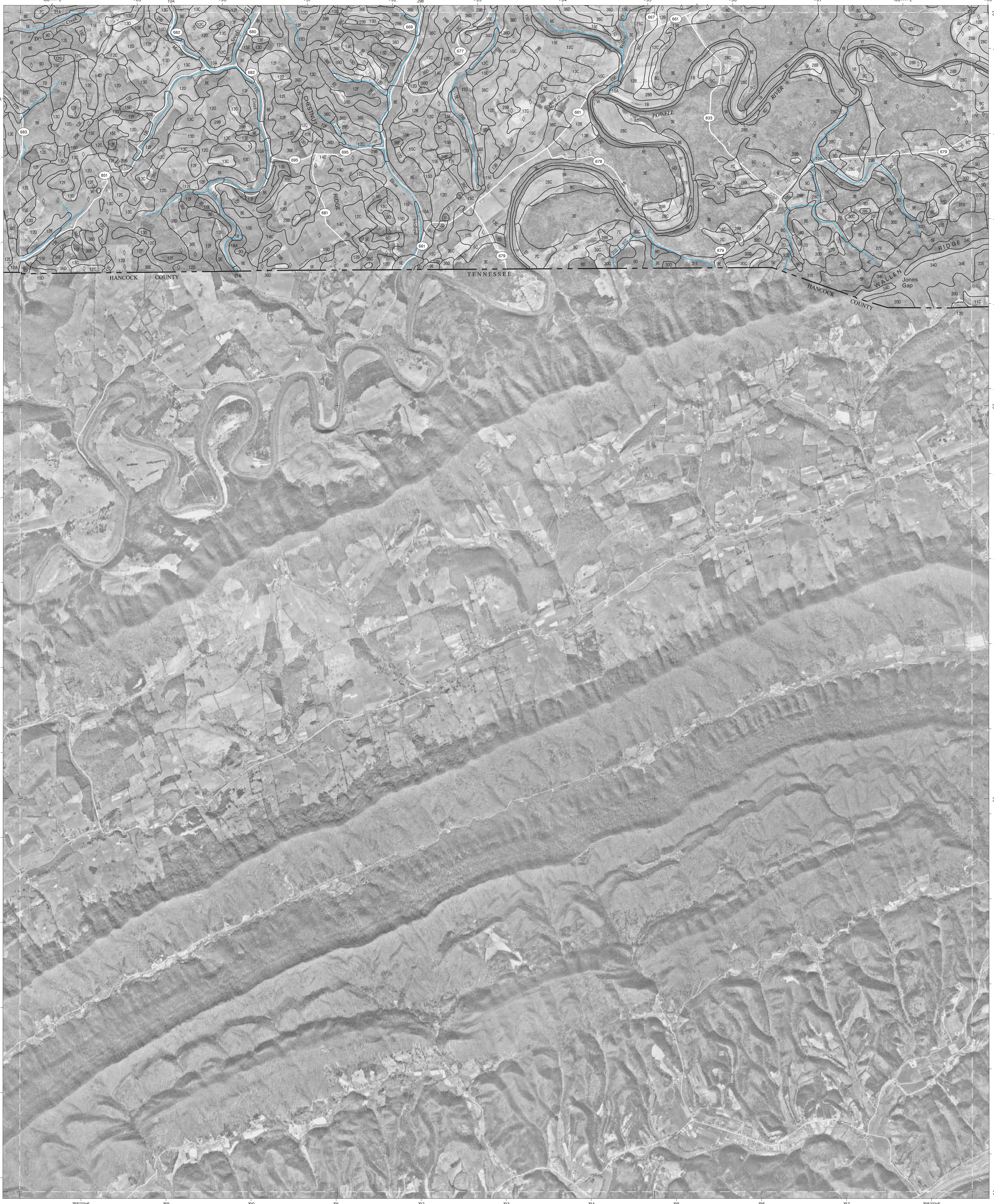
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
BACK VALLEY QUADRANGLE
SHEET NUMBER 17 OF 20



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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

8	9	10
16		18

8 EWING
9 ROSE HILL
10 HUBBARD SPRINGS
16 COLEMAN GAP
18 SNEEDVILLE

INDEX TO ADJOINING 7.5 MAPS

BACK VALLEY, VIRGINIA
7.5 MINUTE SERIES
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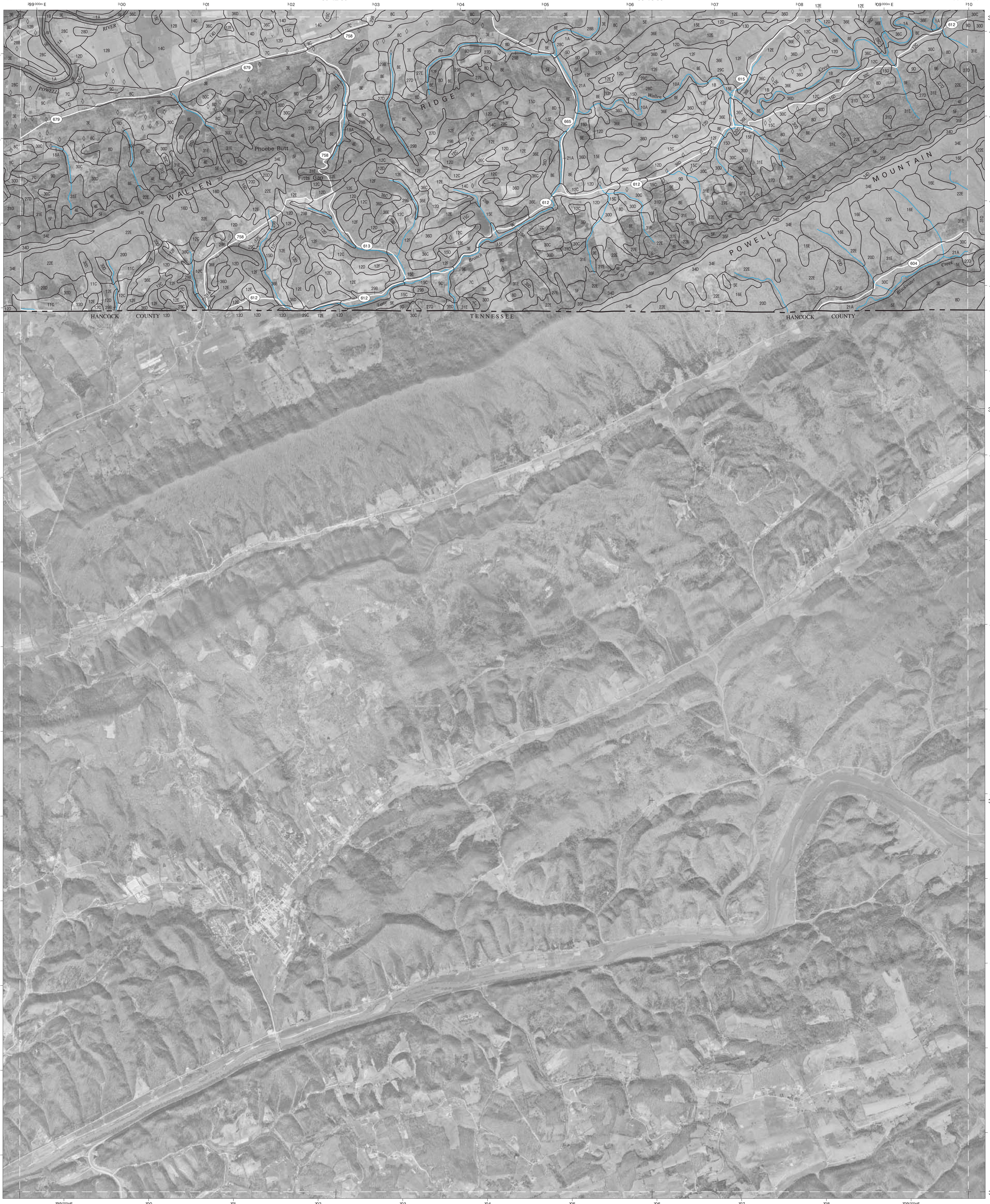
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
SNEEDVILLE QUADRANGLE
SHEET NUMBER 18 OF 20



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

9	10	11
17		19

9 ROSE HILL
10 HUBBARD SPRINGS
11 BEN HUR
17 BACK VALLEY
19 KYLES FORD

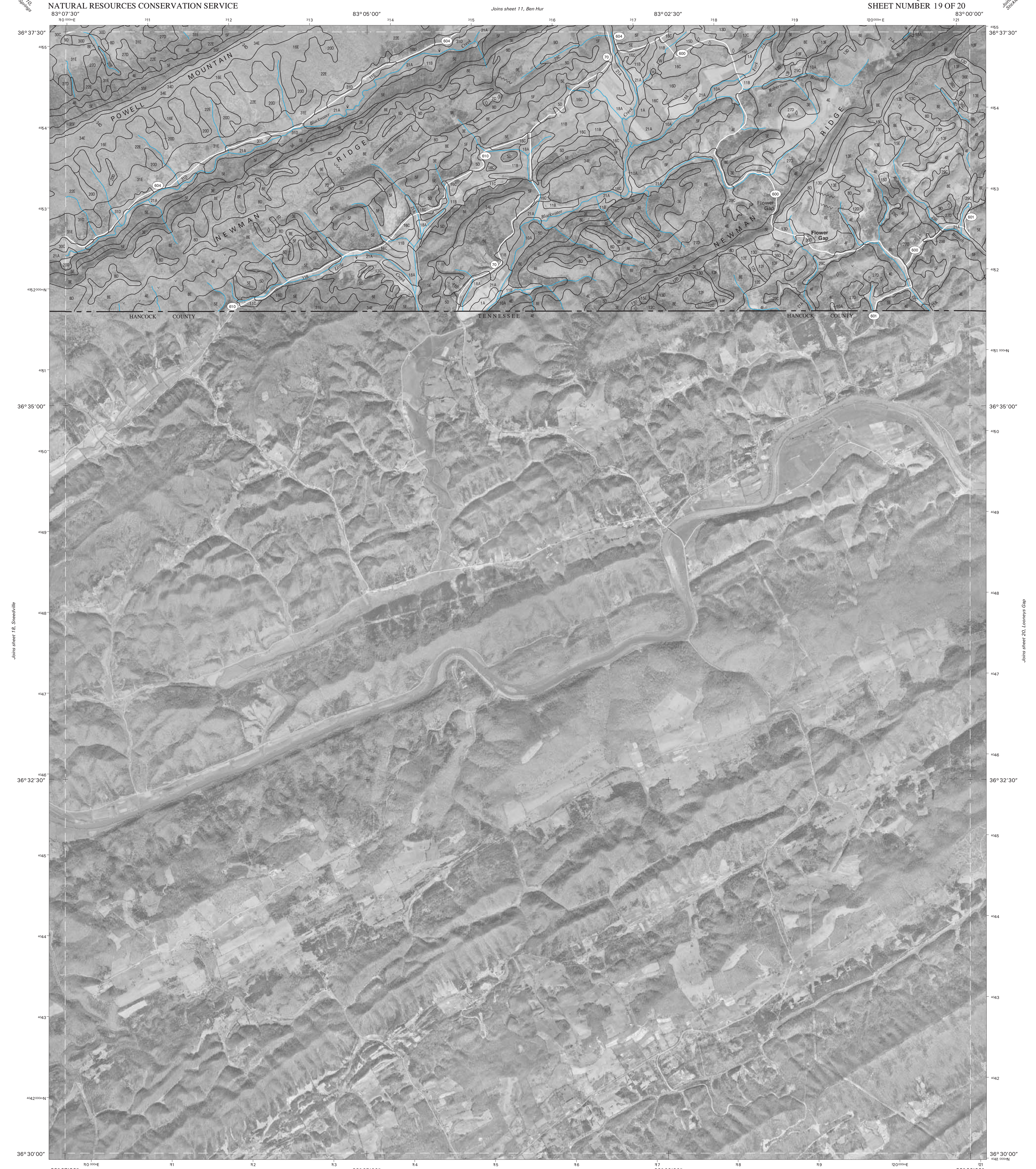
INDEX TO ADJOINING 7.5 MAPS

SNEEDVILLE, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 18 OF 20

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
KYLES FORD QUADRANGLE
SHEET NUMBER 19 OF 20



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 17. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

10	11	12
18		20

10 HUBBARD SPRINGS
11 BEN HUR
12 STICKLEYVILLE
18 SNEEDVILLE
20 LOONEYS GAP

INDEX TO ADJOINING 7.5 MAPS

KYLES FORD, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 20

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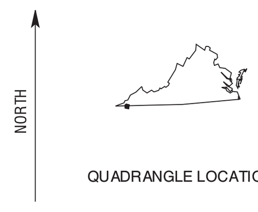
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

LEE COUNTY, VIRGINIA
LOONEYS GAP QUADRANGLE
SHEET NUMBER 20 OF 20

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1995-1998 aerial photography. Hydrography and cultural features were acquired from NRCS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 17.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

SCALE 1:24000

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000

FEET

KILOMETERS

11	12	13
19		

11 BEN HUR
12 STICKLEYVILLE
13 DUFFIELD
19 KYLES FORD

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LOONEYS GAP, VIRGINIA
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 20

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